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PROGRESS IN COKE MANUFACTURE

Up to the early part of the eighteenth century, the iron and steel industry depended entirely on charcoal as a fuel.

With the clearing of the forests—the increase in population and the growing demand for iron and steel, it was necessary that some other fuel be found which could be manufactured on a larger scale. This demand led to the first manufacture of coke.

For many years coke was made in very crude and inefficient ways—first in heaps and mounds—then in beehive ovens. However, only a limited range of coals could be coked satisfactorily by such methods and as the iron and steel industry continued to grow—the time came when it was just as necessary to find a way to make coke more efficiently as it was to find a substitute for charcoal.

This led to the development of the By-Product Coke Oven, in which it was found that good coke could be made from an enormously greater range of coals than could be dealt with in the beehive oven. This development has indefinitely prolonged the life of the iron and steel industry—it is estimated that the new resources of coking coal which have been made available by the by-product oven will be more than sufficient to take care of the estimated iron ore resources of the world.

The By-Product Coking industry has grown to be one of the most vital factors in the industrial supremacy of this country. It has done more to make us a self-contained nation than any other single agency—,new coal deposits have been made available for industrial use—products worth millions of dollars, formerly wasted in smoke are recovered and turned into materials necessary to the welfare of the nation—and it has laid the foundation for our independence of Europe in the matter of dyes.

While great progress has been made, it must continue until all of the coke made in the United States is produced in by-product ovens. Since its inception, THE KOPPERS COMPANY has taken the lead in this industry. Its motto has been "PROGRESS" and through its trained specialists and research and development department it is constantly seeking to make improvements which will insure the greatest efficiency in this important field.

The Koppers Company
Pittsburgh, Pa.

See our exhibit at the
Seventh National Exposition of Chemical Industries
8th Coast Artillery Armory, N. Y.
Week of September 12th.

DESIGNERS AND BUILDERS OF BY-PRODUCT COKE AND GAS OVEN PLANTS

Vol. LXIX THE IRON TRADE REVIEW No. 2
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Price Cuts Help Market Tone

Feeling Grows That Stabilization Point Under Present Costs Is Not Far Away— Better Tonnage Coming Out in Building, Plate and Railroad Work— More Prices Reduced but Shading Still Persists

WHILE recent general reductions in steel prices have brought out only a limited amount of new tonnage, they are serving their part in clearing the air. The feeling is growing that under present cost conditions, the point of ultimate decline and consequent stabilization cannot be far distant. A more expectant tone accordingly characterizes the market on both its buying and selling sides. This is true notwithstanding the fact that the new open prices are yet to undergo a real test, and signs of a recurrence of recent shading already are appearing in both eastern and western districts. Further wage cuts of 15 per cent by eastern and 20 per cent by western mills, have been spreading this week as the lower selling figures have become effective.

Jobbers have been buying in larger volume in the West, particularly in bars and wire products. Automobile plants are keeping up a sustained demand for steel on a 30-day basis. Structural contracts continue in larger volume and the tone is improved as a considerable amount of new work is being offered or revived. Fabricating awards of the week total probably 8000 tons, the largest being 2500 tons for a glass plant at Shreveport, La. The general contract for the Ohio State university stadium Columbus, 5000 tons, has been placed. New work up for figures this week aggregates about 8000 tons.

More Cuts Made

Additional price reductions established to conform with the lowering of major mill lines include $3 to $4 per ton in hoops and bands, $15 per ton in cold-rolled strip steel, $3 in cold-rolled bars, $4 to $12 in boiler tubes, $5 to $8 in standard spikes, $4 in light rails, $4 to $5 in wire rods and similar changes in miscellaneous lines. The season's cotton tie market has been opened at $1.35 per base bundle compared with $2 last year and an average of $1.81 for the past five years.

THE IRON TRADE REVIEW composite market average of fourteen iron and steel products registers a decline of $1.08, this week. The figure is $38.61 compared with $39.69 one week ago, $40.79 two weeks ago and $41.87 three weeks ago.

Plate tonnage in the market arising from railroad, shipyard, oil field and miscellaneous sources is better. A Pittsburgh fabricator has taken 2000 tons for oil tanks and a Coatesville, Pa., mill 1400 tons for stills. Akron has rejected bids on a 2800-ton pipe line. Locomotive orders account for about 1500 tons.

Roads Are Buying

The outlook for railroad buying is increasingly hopeful and a definite conclusion to the proposed financial aid from Washington will materially stimulate this side of the market. Bridge work placed by the railroads this week totals 2000 tons. Shops have been reopened on all sides particularly in the West. The Pennsylvania is figuring on the repairs for several thousand cars and the Erie for 2000. The Illinois Central, Northern Pacific, Great Northern and Soo line all are active on repair work. The Bangor & Aroostook is inquiring for 500 cars. Mexican roads have placed 60 locomotives with two builders with 50 more to follow. Locomotive plants are increasing operations.

The Bethlehem Steel Co. has booked 4500 tons of standard and girder rails for the city of Toronto. China is buying additional railroad equipment in this country. A 13,500-ton rail award for India went to a Welsh mill at about $37.36, delivered. A lower German bid was unacceptable. The American bid was $45. Great Britain's production of pig iron in June was down to 500 tons and of steel ingots and castings to 1500 tons because of the coal strike. The iron and steel industry now is slow in resuming because of the high price of coal.

Iron Prices Lower

Pig iron prices have slumped 50 cents to $1 a ton again this week in practically all districts. A Mahoning valley steelworks is credited with the purchase of 2000 tons of basic at $19.50 valley. Foundry iron now is readily obtainable at $20 valley. Basic and foundry iron in eastern Pennsylvania are off $1 to $2 a ton. Buffalo iron has been sold at $19 to $19.50. Alabama iron has been quoted as low as $19 and southern Ohio at $20. General buying seems a shade better. Automobile foundries are taking in more tonnage.

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IN THIS ISSUE

	PAGE
Iron and Steel Market Review	65
Editorials	66, 67
Iron, Steel and Scrap Prices	68, 126, 130
Index to Market Reports	68
Iron and Steel Markets	69 to 79
Foreign Markets	83 to 86
Tariff Is Under Attack	83
Rail Equipment Chief Demand	86
Prepare To Make New Wage Cuts	87
Builds New Sheet Mill in East	89
Solving the Frequency Problem	92
Turning Up Trade in Morocco	96
American Malleable Cast Iron	98
Smelting Iron Ore with Electricity	101
Extracting Flue Dust Electrically	102
News of Societies	106
May Advance Roads $500,000,000	107
Rail Financing Plan Important	108
Improvement Noted in Northwest	112
Mine Operators More Hopeful	113
Tool Inquiry Shows Some Activity	118
Electrical Industry Grows Three-fold Since 1914	121
Construction and Enterprise	121
Industrial Business Changes Recently Announced	132
New Trade Publications	132

The Tariff and the Dye Industry

CONSIDERATION of the revision of the tariff affecting the chemical industry takes on additional importance when viewed in the light of the production of coal tar dyes in 1920. According to the report of the United States tariff commission just published, the output of dyes in the United States in 1920 amounted to 88,000,000 pounds valued at $95,000,000, which is a 40 per cent increase in quantity and value over the output of 1919. Still more surprising is the comparison with prewar conditions, which shows that the domestic production last year exceeded the annual imports before the war by 92 per cent. As might be expected in view of this remarkable record, the imports to the United States in 1920 showed a decline, only 3,400,000 pounds of dyes, valued at $5,760,000 being received from European countries.

On the other hand, exports in 1920 totaled $25,000,000, or double the value of those in the preceding year. The satisfaction that might be expressed over this improvement is dulled by the rapid decline in dye exports experienced in the first four months of 1921. The shipments in April amounted to only 10 per cent of the average monthly exports in 1920. The return of German and English competition and the world-wide depression in business doubtless are the contributing factors in this rapid curtailment of export business in dyes.

These statistics seem to emphasize the need of ample protection for the dye manufacturers. Starting with almost nothing, the industry leaped into prominence during the war and in the confusion of reconstruction has reached a position which makes the country practically independent of imported coal tar products. To allow this industry to revert to its prewar condition of helplessness would be the height of folly, and fortunately the great majority subscribes to this opinion. The reported opposition of certain Democratic and Republican congressmen to the proposed dye schedules in the Fordney permanent tariff bill presumably is based on the method of safeguarding domestic producers and not, it is hoped, on the principle of protection. The dye industry differs widely from any other industry and requires different treatment. For the next few years, at least, it should receive the benefit of special legislation.

Why Trade Commission Fails

UNLIKE all other comparable government agencies, the federal trade commission refuses to amplify its decisions with explanatory opinions. The President gives the why and wherefore of his vetoes, the Supreme Court hands down its opinions, the interstate commerce commission spares no effort in citing why it has sustained or rejected a complaint, but the trade commission persists in stating it has issued or dismissed a complaint or an order, and stops there.

Nothing has cost the commission more prestige than this attitude. It is not a coincidence that the commission seems to have fewer friends among business men than any other federal body and has lost an overwhelming majority of its actions in court. By refusing to take the business world into its confidence the commission has erected around itself a wall of secrecy, a wall that has shut out much good will but has not appreciably hindered the growth of hostility and opposition.

Practically the only time in its history that the commission has clearly stated its opinions and methods of reasoning in an outstanding case was when it refused to issue a complaint in the Pittsburgh basing point action about a year ago. Later, in reconsidering this decision, however, the commission reverted to its practice of silence. A short time ago the commission borrowed a leaf from the experience of the commerce commission and provided for tentative decisions by the examiners in various hearings. Where the commerce commission gives these tentative decisions to the public, however, the trade commission is planning

to enshroud them in secrecy. The Pittsburgh basing point case now at issue is far too important and far-reaching not to let the light of day penetrate into every angle of this complicated controversy. The commission will lose nothing by doing its thinking out loud. No step will be misinterpreted when the public is fully informed as to grounds for such action. A little sunlight into dark corners will go far toward killing the germs of distrust that may threaten the usefulness and in time the very existence of the commission.

More Information Needed

RECENTLY the trade papers and the programs of iron and steel, metallurgical and engineering organizations in the United States and abroad have reflected an unusual interest in special alloy steels. Much attention is being given to molybdenum steels, to alloys with acid resisting properties, and to materials possessing unusual characteristics in other directions. As a rule, the early development of a new special steel is closely guarded, and even after the product is announced to the public and is placed on the market for sale, the important facts regarding its manufacture, heat treatment and uses are known only to a relatively few people.

While obviously it is necessary to surround an invention with secrecy until it is protected by patent or other means, it often is true that failure to give out important data on a new product results in a general misunderstanding and frequently misgivings regarding its advantages. For example, stainless steel seems to be suffering from a lack of appreciation in some quarters of its desirable characteristics simply because many of the persons who handle this alloy do not know how to treat it properly. This fact was emphasized in the discussion of Elwood Hayne's paper on stainless steel at the American Iron and Steel institute, in which it appears that accurate information regarding the heat treatment of the product is not widely disseminated.

The merits of stainless steel, as well as those of many other special steels, have been broadly advertised and as a rule the users of these products are familiar with the claims of the manufacturers. However, to be of value, the data on the performance of a certain steel must be accompanied by accurate instructions as to its treatment and use. Therefore, those who are interested in the successful development and marketing of an alloy should be satisfied that the prospective users are furnished with all of the information they require in order to thoroughly understand and appreciate the steel.

Speed Pay to Carriers

THE statement issued in New York recently by the Association of Railway Executives, showing that extensive reductions in freight rates have been made by the railroads of the country since the general increase authorized by the interstate commerce commission last year, would sound ironical to shippers who have been praying for relief from oppressive rates, did it not indicate a responsive attitude on the part of the carriers and give promise of more important revisions should the government carry out its plans to assist them financially. According to the association's report, up to June 9,153,319 reductions have been made in eastbound rates, 1272 reductions in westbound rates and 120 reductions in export and import rates. The reductions affected iron and steel, grain, food products and other basic commodities.

The report indicates that the railroads are endeavoring to revise their rates downward wherever possible, but the aggregate of their efforts in this direction thus far may be unimportant as compared with what appears to be forthcoming with railroad wages reduced, economies practiced in every department and the government funding the roads' debt to the public. By far the most important news affecting industrial America that has come out of Washington in many months is that detailing the administration's tentative plan for assisting the carriers to regain their equilibrium by paying off its indebtedness to the carriers. Under this plan the sum of $500,000,000 would be advanced which would enable the roads to pay up their back bills and would release much delayed needs. Until the government does its utmost to help the railroads out of the predicament which it got them into the shippers of the country will have to rest content with such minor adjustments as the railway executives' report shows.

"With all the savings the railroads can hope to make as a result of the wage reductions and other economies," the Association of Railway Executives states, "it is only with the utmost difficulty that they can hope to earn the $475,000,000 necessary to meet their fixed charges for 1921. The best the roads can do is to readjust rates on the existing levels so as to remove inequalities and maladjustments that have resulted from successive blanket increases."

The announcement that the administration has a definite plan for financial relief, coming immediately after this statement by the railway executives, changes the outlook materially. These plans should be matured as rapidly as possible. Delay will only increase the general demoralization of trade, as business would be materially helped by a return of the railroads to the market and eventually by lower freight rates.

Iron and Steel Prices

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products. Yesterday, One Week, One Month, Three Months, One Year and Seven Years Ago

July 13, 1921	July 6, 1921	June, 1921	April, 1921	July, 1920	July, 1914
$38.61	$39.69	$41.87	$43.84	$68.69	$22.17

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

SCRAP PRICES, PAGE 126, WAREHOUSE, ORE, CAST IRON PIPE, FERROALLOY AND OTHER PRICES, PAGE 130

Pig Iron

Bessemer, valley	$21.50 to 22.00
Bessemer, Pittsburgh	23.46 to 23.96
Basic, valley	19.00 to 20.00
Basic, Pittsburgh	20.96 to 21.96
Basic, Buffalo	20.00 to 21.00
Basic delivered, eastern Pa.	22.00 to 23.00
Malleable, valley	20.00 to 20.50
Malleable, Pittsburgh	21.96 to 22.46
Malleable, Chicago	19.00 to 20.00
Malleable, Buffalo, furnace	21.50 to 22.00
Malleable, del., eastern Pa.	25.50 to 26.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del. Phila.	24.60 to 26.50
No. 1X, Buffalo	23.75 to 25.00
No. 2 foundry, valley	20.00 to 21.00
No. 2 foundry, Pittsburgh	21.96 to 22.96
No. 2 foundry, Buffalo	20.75 to 22.00
No. 2 foundry, Chicago	19.00 to 20.00
No. 2 foundry Ironton furnace	20.00 to 21.00
No. 2 foundry, Cleveland	22.00 to 22.50
No. 2X, eastern del. Phila.	21.85 to 25.50
No. 2X, eastern N. J., tidewater	22.80 to 25.50
No. 2X, eastern del. Boston	25.06 to 27.06
No. 2X foundry, Buffalo fur.	22.00 to 23.25
No. 2X, Buffalo del. Boston	25.46 to 26.46
No. 2 foundry del. Philadelphia	21.85 to 24.50
No. 2 foundry, N. J., tidewater	22.80 to 24.50
No. 2 southern, Birmingham	19.00 to 21.00
No. 2 southern, Cincinnati	24.00 to 25.00
No. 2 southern, Chicago	25.66 to 27.66
No. 2 southern, Philadelphia	27.66 to 29.66
No. 2 southern, Cleveland	25.66 to 27.66
No. 2 southern, Boston	26.65 to 28.65
No. 2 southern, St. Louis	24.72 to 26.72
No. 2X, Virginia furnace	25.00
No. 2X, Virginia Philadelphia	30.74
No. 2X, Virginia Jersey City	31.29
No. 2X, Virginia Boston	30.58 to 31.83
Gray forge, eastern Pa.	23.25 to 24.25
Gray forge, val., del., Pitts.	21.46
Low phos., standard, valley	37.00 to 38.00
Low phos., standard, Phila.	43.32
Low phos., Lebanon furnace	35.00
Charcoal, Superior, Chicago	35.50 to 37.50
Charcoal, Birmingham	35.00

Silvery Iron

8 per cent base

Jackson County, O., furnace	33.00
Tennessee, Chicago delivery	35.50
Ohio brands, Chicago	38.32

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 per cent	$45.00
11 per cent	48.30
12 per cent	51.60

Coke

Connellsville furnace	$2.75 to 3.00
Connellsville foundry	4.00 to 4.75
Pocahontas furnace	8.00 to 8.50
Pocahontas foundry	8.50 to 9.50
New River furnace	6.50 to 7.50
New River foundry	8.00 to 9.00
Wise county furnace	5.25 to 5.75
Wise county foundry	6.00 to 7.00
Alabama furnace	5.00 to 5.50
Alabama foundry	6.00 to 7.00

Semifinished Material

BILLETS AND BLOOMS (4 x 4-inch)

Open-hearth, Pittsburgh	$33.00
Open-hearth, Youngstown	33.00
Open-hearth, Philadelphia	38.74
Bessemer, Pittsburgh	33.00
Bessemer, Youngstown	33.00
Forging, Philadelphia	43.74
Forging, Pittsburgh	38.00

SHEET BARS

Open-hearth, Pittsburgh	$35.00
Open-hearth, Youngstown	35.00
Bessemer, Pittsburgh	35.00
Bessemer, Youngstown	35.00

SLABS

Pittsburgh and Youngstown	$34.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$42.00 to 43.00
Grooved skelp, Pittsburgh	2.00c
Universal skelp, Pittsburgh	2.00c
Sheared skelp, Pittsburgh	2.00c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.00c
Structural shapes, Philadelphia	2.20c to 2.35c
Structural shapes, New York	2.23c to 2.38c
Structural shapes, Chicago	2.33c to 2.38c
Tank plates, Pittsburgh	1.90c to 2.00c
Tank plates, Philadelphia	2.20c to 2.35c
Tank plates, New York	2.23c to 2.28c
Tank plates, Chicago	2.28c to 2.38c
Bars, soft steel, Pittsburgh	1.90c
Bars, soft steel, Philadelphia	2.25c
Bars, soft steel, New York	2.28c
Bars, soft steel, Chicago	2.28c
Bars, hard steel, Chicago	2.00c
Bar iron, common, del. Pitts.	2.28c to 2.55c
Bar iron, common, Philadelphia	2.20c to 2.25c
Bar iron, common, New York	2.23c to 2.28c
Bar iron, common, Chicago	2.10c

Market Report Index

Weekly Market Review	65
Pig Iron	69
Coke	71
Ore	72
Bars	72
Nuts, Bolts, and Rivets	72
Plates	73
Tin Plate	73
Semifinished Steel	74
Scrap	74
Warehouse	74
Wire	74
Cotton Ties	75
Sheets	75
Cold-Rolled Strip Steel	75
Concrete Reinforcing Bars	76
Structural Shapes	76
Cars, and Track Materials	77
Merchant and Cast Pipe	78
Ferroalloys	78
Nonferrous Markets	79
British Market	83
Belgian Market	83
French Market	83
German Market	84
Canadian Market	85
Export Market	86
Refractories	117
Coke By-Products	117
Machine Tools	118

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.50c to 2.60c
Bands, Pittsburgh	2.50c to 2.60c
Cold finished steel bars, Pittsburgh base	2.80c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, St. Louis	25.00 to 27.50
Relaying rails, Pittsburgh	30.00 to 35.00
Light rails, 25 to 45, mill	1.90c to 2.20c
Angle bars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.00c
Spikes, railroad, Chicago	3.63c to 3.78c
Track bolts, Pittsburgh	4.00c to 4.20c
Track bolts, Chicago	4.38c to 4.73c
Tie plates, Pittsburgh	2.50c
Tie plates, Chicago	2.50c

Wire Products

100 lbs. jobbers, carloads; retailers, 10c more

Wire nails, Pittsburgh	$2.75
Plain wire, Pittsburgh	2.50
Galvanized wire, Pittsburgh	3.00
Barbed wire, painted, Pitts.	2.90
Barbed wire, galv., Pittsburgh	3.40
Polished staples, Pittsburgh	2.90
Galvanized staples, Pittsburgh	3.40
Coated nails per count keg, Pitts.	2.35

Chain, Piling, Strip Steel

Chain, 1 in. proof coil, Pitts.	6.25c
Sheet piling base, Pittsburgh	2.05c
Hot rolled strip steel, Pittsburgh stamping quality	2.50c to 2.60c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.50c
No. 28, bessemer, Pittsburgh	3.50c
No. 28, open-hearth, Phila.	3.45c to 3.85c
No. 28, open-hearth, Chicago	3.88c

TIN MILL BLACK

No. 28, open-hearth, Phila.	3.85c
No. 28, open-hearth, Chicago	3.88c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.50c
No. 28, bessemer, Pittsburgh	50c
No. 28, open-hearth, Phila.	4.60c to 4.85c
No. 28, open-hearth, Chicago	4.88c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.65c
No. 10, bessemer, Pittsburgh	2.65c
No. 10, open-hearth, Phila.	3.00c
No. 10, open-hearth, Chicago	3.03c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pittsburgh	$5.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers Carloads

	Black	Galv.
1 to 3-inch, butt steel	64½	52
1 to 1½-inch, butt iron	39½	24½

Boiler Tubes

Steel, 3¼ to 13 inches, c. l.	52 off
Iron, 3½ to 4½ inches, c. l.	26 off

Prices Past and Present

Representative market figures yesterday, one month ago, three months ago and one year ago

	July 13, 1921	June, 1921	April, 1921	July, 1920
PIG IRON—				
Bessemer, valley, del., Pittsburgh	$23.46	$25.06	$27.46	$46.80
Basic, valley del., Pittsburgh	21.46	23.16	24.84	47.40
No. 2 Foundry, val. del., Pitts.	21.96	24.26	26.84	46.40
No. 2 Foundry Chicago	19.50	21.10	24.25	44.40
Lake Superior charcoal, Chicago.	36.50	38.30	38.50	57.50
Malleable, valley	20.00	22.60	25.00	44.80
Malleable, Chicago	19.50	21.30	24.75	44.90
*Southern No. 2, Birmingham	20.00	21.70	23.00	42.30
*Southern Ohio, No. 2 Ironton	20.00	22.80	25.85	44.00
Basic eastern del. eastern Pa.	22.50	24.70	25.00	44.10
**No. 2X, Virginia furnace	25.00	26.00	27.10	46.75
**No. 2X, eastern del. Phila.	22.85	26.00	26.25	48.55
Gray forge val. del. Pittsburgh	21.46	23.16	25.84	45.40
Ferromanganese, 80 per cent, del.	75.00	76.50	87.50	190.00
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh.	35.00	37.40	38.75	70.00
Sheet bars, open-hearth, Pitts.	35.00	37.40	38.75	75.00
Billets bessemer, Pittsburgh	33.00	37.00	37.75	65.00
Billets, open-hearth, Pittsburgh	33.00	37.00	37.75	65.00
FINISHED MATERIAL—				
Steel bars, Pittsburgh	1.90	2.05	2.10	3.25
Steel bars, Chicago	2.28	2.44	2.46	3.52

	July 13, 1921	June, 1921	April, 1921	July, 1920
FINISHED MATERIAL—Continued				
Iron bars, Philadelphia	$2.20	$2.25	$2.35	$4.50
Iron bars, Chicago mill	2.10	2.22	2.48	3.75
Beams, Pittsburgh mill	2.00	2.05	2.15	3.25
Beams, Philadelphia	2.25	2.40	2.45	3.50
Beams, Chicago	2.38	2.44	2.53	3.52
Tank plates, Pittsburgh	1.90	2.00	2.15	3.50
Tank plates, Chicago	2.15	2.37	2.53	3.77
Tank plates, Philadelphia	2.25	2.35	2.45	3.55
Sheets, blk., No. 28, Pittsburgh	3.50	3.90	3.90	7.00
Sheets, blue anl., No. 10, Pitts.	2.65	3.00	2.95	5.00
Sheets, galv., No. 28, Pittsburgh	4.50	4.90	4.90	7.50
Wire nails, Pittsburgh	2.75	3.00	3.20	4.00
COKE—				
Connellsville furnace ovens	2.75	3.15	3.60	15.20
Connellsville foundry, ovens	4.50	4.50	5.00	16.10
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	12.00	13.10	13.00	25.70
Heavy melting steel, eastern Pa.	11.25	11.85	11.75	22.00
Heavy melting steel, Chicago	10.50	11.10	11.25	23.70
No. 1 wrought, eastern Pa.	14.50	15.50	15.60	33.50
No. 1 wrought, Chicago	10.00	10.80	12.00	28.10
Rerolling rails, Chicago	12.50	12.80	12.70	34.90

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Pig Iron Decline Not Arrested

General Drooping of 50 Cents or More in Market Prices Is Shown—Valley Basic at $19.50, Foundry at $20—Buffalo Sells Under $20—Southern Iron Offered at $19—Eastern Levels Lower

Philadelphia, July 12.—The pig iron market here broke badly the past week and prices recently established on eastern Pennsylvania foundry iron in other districts, now are being done here. Sales of No. 2 X (2.25 to 2.75 silicon) were made in this district the past week at $21 to $23 eastern Pennsylvania furnace, depending on tonnage and competition. Some small lots still are going at old prices of $23.50 to $24 furnace for No. 2 plain, (1.75 to 2.25 silicon). The differential between No. 2 plain and No. 2X apparently now is being disregarded altogether but the lowest price on No. 1 X (2.75 to 3.25 silicon) during the week was slightly under $24 eastern Pennsylvania furnace. Present prices surprisingly were brought out on 100 and 200-ton lots; in fact large tonnages are lacking here. The number of buyers has increased. An eastern Pennsylvania consumer bought 600 tons of basic. The market on this grade now is $22 to $23 delivered eastern Pennsylvania. A couple hundred tons of copper bearing low phosphorus was sold at $35 furnace. Copper-free low phosphorus iron is featureless. Gray forge is nominal at $22 eastern Pennsylvania furnace. A Delaware consumer is inquiring for basic. A Worcester, Mass., consumer has not yet acted on its basic inquiry. Malleable is nominal at $24 to $25 furnace.

Small Orders Increase

Chicago, July 12.—Foundry iron activity in the Chicago district is somewhat improved. While no large tonnage is offered, small orders for pig iron have increased in number. Furnace operations are unchanged and prices are soft. One hundred tons of malleable was sold in the week to a Wisconsin melter at $19.50, Chicago. A Michigan manufacturer bought three carloads of resale foundry iron at $21, delivered. Resale silvery iron is now out of the market. The furnace price for 8 per cent iron is $33, equivalent to $38.32, delivered in Chicago. Charcoal iron has sold during the week at $32, furnace, but observers feel this is due for a sharp drop as it is regarded as out of proportion with pig iron.

Competition Active In East

New York, July 12.—Sharp competition is being waged by Buffalo and eastern Pennsylvania furnaces for such attractive pig iron orders as are offering.

Some eastern Pennsylvania foundry iron has been sold for shipment to New England at as low as $21, f.o.b. furnace, for 1.75 to 2.25 per cent silicon, while Buffalo 2.25 to 2.75 silicon has been sold in New England at $20, f.o.b. furnace. In connection with this competition, it is of interest to note that silicon differentials in some cases are being disregarded, and although there are numerous rumors, it is not definitely known that any Buffalo foundry has been sold at less than $20, base, for shipment east. A Bridgeport consumer is understood to have bought 500 tons of No. 2 plain between $19 and $19.50, Buffalo. Eastern Pennsylvania foundry has been sold for Newark delivery at around $23, base, while Buffalo foundry has brought $21, base, furnace, or $21, furnace, without respect to silicon. Some eastern Pennsylvania makers, on tonnages for eastern Pennsylvania and Southern New Jersey consumers, have been obtaining around $24, base, furnace, with $1 differentials. Virginia foundry continues to be held at $24, base, furnace. Some more central Pennsylvania foundry has been sold here at $22, furnace, for 2.25 to 2.75 silicon. Inquiry in this district is larger than usual of late, and, including the 600 tons for Bridgeport, totals 1800 to 1900 tons, mostly foundry. Export inquiries total over 1000 tons.

Prices Again Decline

Cleveland, July 12.—Pig iron prices have slipped 50 cents to $1 further in the week under the same conditions of a soft market and light buying that have existed for some months. Iron now readily is available at $20 lake or valley furnace for base or lower grade. On the differentials above base varying advances are asked, all less than the regular amount, and these average around 75 cents to $1 per unit of silicon. On this basis, one lot of 300 tons of 2.25 to 2.75 silicon for western Pennsylvania delivery was sold at $20.75 valley. One producer in the week disposed of about 1200 tons including two lots of 200 tons each at $20 and $21 base, the lower figure applying to the last transaction. Cleveland iron is quoted at $21 to $22 base furnace. The American Radiator Co. again came into the market the past week with inquiries of about 2000 tons for Buffalo, 750 to 1000 tons for Detroit, 350 tons for Springfield and 250 tons for Titusville, and is understood to have bought partially at least. The Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., inquired for 500 tons of manganese high silicon basic. An inquiry for 900 tons of basic for western Pennsylvania was up this week. Some very low prices on Alabama iron, believed to be resale lots, have developed in this district. One lot of 3 per cent iron was sold at $26 delivered or $19.34 Birmingham. It is reported that

this iron has been in warehouse in this city for several months. Buying generally is extremely light but a better feeling seems to be appearing in certain quarters of the market. Some producers are inclined to believe that operations are so low that the irreducible minimum has been reached. Automobile foundries have been increasing their specifications for iron during the past week, and a better outlook for melt in this direction is presented. The Perry furnace at Erie which blew in several months ago went out this week indefinitely. The McKinney Steel Co. has banked its single active furnace in the city.

Transactions Are Light

Pittsburgh, July 12.—Quietness continues to prevail in the pig iron market here. On the surface this appears to be a slight buying movement of resale metal although the tonnages changing hands are not large in the aggregate. Transactions in this direction have had little effect toward reducing stocks. Little demand exists for bessemer iron. Inquiries for this grade are exceedingly light. Two inquiries for bessemer were received today, one calling for a carload and another for 50 tons. These tonnages are representative of the amount of going business at present. Quotations on this grade continue from $21.50 to $22.00 valley, although the amount of business in this direction is not of sufficient volume to give the market a real test. The demand for basic also is light with buyers showing little interest in offering. The last block of basic which changed hands recently was a 2000-ton lot sold by a valley steel works interest at $20, furnace. The consumer has been a persistent buyer of valley iron and its transactions of about two weeks ago bring its total purchases for the year to around 11,000 tons. Basic continues quotable between $19 and $20 valley. Offerings of foundry iron at $20.50, valley, finds no takers, business in this direction being very dull. Iron is obtainable readily at $20 base valley. The Standard Sanitary Mfg. Co. was the buyer of 300 tons of 2.25 to 2.75 silicon at $20.75 valley. The American Radiator Co. has had out a new inquiry this week for 250 tons for Titusville.

Tonnages Pending

Boston, July 12.—No quotable change in prices has developed in the pig iron market over the week and the tonnage moved has been exceptionally small. Outside of a sale of 200 tons for a Framingham, Mass., foundry, of 2.75 to 3.25 silicon iron, little is reported in this district. The price in this contract has not been divulged, but it is known to be very low. One hundred tons of charcoal iron has changed hands, price not stated. This is to be stored by consumers for future requirements. Apparently orders for about 2000 tons of iron are pending in this district, of which 600 tons of 2.25 to 2.75 silicon is wanted by the Saco Lowell shops. A Massachusetts foundry wants 200 tons more and another 1000 tons. Two other lots of 100 tons each of 2.75 to 3.25 silicon have been placed. Price has not been named, but is understood to have been high, having been sold by a Buffalo furnace which has not made any pretense of meeting competition. The American Steel & Wire Co. is making inquiries for about 1000 tons of basic iron. The exact quantity is not known, but is believed to be for a month's supply. Buffalo iron is quoted anywhere from $21 to $23 a ton, whch is equivalent to $26.46 to $28.46, delivered in New England. Eastern Pennsylvania iron is ranging from $24 to $26 a ton, or $28.06 to $30.06, delivered, silicon. Differentials are a matter of negotiation. Although not properly included in this week's business, having been placed some time ago, it is understood that the entire order of 5000 tons for the H. B. Smith Co., Westfield, Mass., has been placed. No prices have been disclosed. While the melt in the Massachusetts district is constant at the low levels prevailing for the past month, the outlook has improved slightly.

Radiator Company Again Buys

Buffalo, July 12.—The feature of the market was the purchase late last week

Composite Market Record

Monthly Averages of Fourteen Products, 1913-1921, Compiled by The Iron Trade Review

1921	
July 7	$ 39.69
June 29	40.79
June 22	41.23
June 15	42.15
June 8	42.45
June 1,	42.71
Average for June	41.87
May 25,	43.03
May 18,	43.05
May 11,	43.58
May 4,	43.61
Average for May	43.32
April 27,	43.73
April 20,	43.85
Apr. 13,	43.93
Apr. 6,	45.65
Average for April	43.84
Mar.	45.37
Feb.	48.81
Jan.	51.98
1920	
Dec.	53.45
Nov	63.75
Oct	68.61
Sept.	68.86
Aug.	68.87
July	68.69
June	68.29
May	68.66
April	67.49
Mar.	65.47
Feb.	65.63
Jan.	59.40
Average for year	65.60
1919	
Dec.	55.2(
Nov.	52.3:
Oct.	45.16
Sept.	48.75
Aug.	48.67
July	48.26
June	48.28
May	48.69
Apr.	48.85
Mar.	52.68
Feb.	53.71
Jan.	$ 53.81
Average for year	50.37
1918	
Dec.	57.17
Nov.	55.63
Oct.	57.49
Sept.	56.56
Aug.	56.67
July	56.66
June	56.62
May	56.59
April	56.59
Mar.	56.71
Feb.	56.67
Jan.	56.67
Average for year	56.67
1917	
Dec.	56.68
Nov.	58.29
Oct.	67.75
Sept.	83.18
Aug.	89.69
July	89.56
June	82.66
May	73.96
April	66.48
Mar.	61.07
Feb.	56.76
Jan.	55.10
Average for year	70.10
1916	
Dec.	53.68
Nov.	46.77
Oct.	41.50
Sept.	39.97
Aug.	39.67
July	39.37
June	39.63
May	39.78
April	39.13
Mar.	37.18
Feb.	35.63
Jan.	33.66
Average for year	40.50
1915	
Dec.	$ 31.56
Nov.	28.64
Oct.	26.19
Sept.	25.55
Aug.	24.77
July	24.25
June	23.74
May	22.89
April	22.66
Mar.	22.71
Feb.	22.21
Jan.	21.90
Average for year	24.76
1914	
Dec.	21.58
Nov.	23.39
Oct.	22.84
Sept.	3.17
Aug.	22.72
July	22.17
June	22.58
May	22.99
April	23.39
Mar.	23.60
Feb.	23.52
Jan.	23.03
Average for year	22.92
1913	
Dec.	23.29
Nov.	24.02
Oct.	24.91
Sept.	25.55
Aug.	25.97
July	26.34
June	26.78
May	27.34
April	27.74
Mar.	27.93
Feb.	28.05
Jan.	27.96
Average for year	26.32

of 3000 tons of foundry iron by the American Radiator Co., this being the second large purchase of this metal within the space of two weeks. First reports place the figure slightly under $20. The price of the previous 2200 tons has been variously placed at $18.75 and $19.25, but there seems to be some question whether this was a straight furnace transaction or a short sale by brokers against which the latter are yet to cover. The price on smaller lots seems to be fairly firm around $20.75 and $21. One furnace sold an aggregate of 1000 tons, which if reckoned on the silicon differential basis would be slightly below this. This furnace sold 2.25 to 2.75 iron at $21. Another sold an aggregate of 300 tons at $21 for No. 2 plain (1.75 to 2.25 silicon). Another producer states an aggregate of 500 tons was sold at $22 base. Some high sulphur iron has been sold under $20. Inquiry reported during the week was high, one furnace putting it at 6000 tons and another at 7000 tons. The Radiator company tonnage is thought to be included in these figures. One inquiry was for 500 tons.

Lower Prices Are Quoted

Cincinnati, July 12.—Pig iron prices here are showing a decided tendency toward a lower level as a result, sellers say, of the eagerness of holders to convert their stocks into money. Quotations recognized by most local dealers are lower than last week's prices. It is said that some southern Ohio iron has been sold down to $20, Ironton, for the base grade in limited tonnage for immediate delivery, and Southern iron is being quoted as low as $19, Birmingham, for shipment into this territory. Speculation is rife as to the probable near future course of prices, a matter on which there is a wide variance of opinion. In the main, however, a still lower level is anticipated. Practically all orders coming into the market, all of which are limited to small lots, are accompanied by requests for shipment at once, indicating that only actual day-by-day requirements are being met. No inquiries of importance are out. The American Radiator Co. this week again was in the market for several hundred tons of iron for Springfield, O., and is understood to have closed.

Extreme Dullness In South

Birmingham, Ala., July 11.—Pig iron quotations are weak, and while $21 is given as the base for No. 2 foundry (1.75 to 2.25 silicon) it is admitted that a concession of $1 per ton would be granted on tonnages. It is said that it is possible to buy at even lower price. Large melters of iron are beginning to experience the severest depression and are using less iron. The Alabama Co. will blow out its remaining furnace this week, and the Woodward Iron Co. which has the only furnace on foundry iron in this territory, may follow later. The Tennessee Coal, Iron & Railroad Co. has five furnaces on basic iron but one of these will be banked from time to time. Exaggerated reports of sales made recently in this district are still commented on. The American Radiator Co. bought only 1000 tons of pig iron, while the cast iron pipe interests bought as their needs presented, the largest tonnage at one time being 1500 to 2000 tons. Surplus stocks of pig iron in Alabama continue heavy.

Offer More Distress Coke

Makers Quote 25 Cents Off To Move Accumulations, Foundry Selling at $3.75—Easier Tendency Noted—5000 Tons of Furnace Fuel Wanted

Pittsburgh, June 12.—Considerable slackness prevails in the coke market with no likelihood of an immediate improvement in demand. Distress foundry coke has been offered as low as $3.75, according to well-founded reports, but as a rule the market for this grade centers between $4 and $4.50, Connellsville. One producer has been disposing of about 50 carloads weekly at the latter figure, a large percentage of the shipments constituting single carloads for consumers not directly connected with the iron and steel industry. Some producers are operating their ovens for the express purpose of obtaining their gas supply for their boilers and to prevent their output from accumulating on tracks they frequently quote 25 cents under the market. According to reports this morning, the Colonial Iron Co. is in the market for 5000 tons of furnace fuel. Operators continue to hold to $3, ovens, for spot furnace fuel while standard selected 72-hour coke is quotable between $4 and $4.50. Production according to the *Connellsville Courier* for the week ending July 2 was 23,640 tons, a decrease of 4540 tons compared with the previous week.

Sales Limited to Foundries

Philadelphia, July 12.—Coke business here is limited to standard foundry, held at $4.25 to $5, Connellsville. However, some sales of standard foundry coke have been made at $4.

Consumption Further Curtailed

St. Louis, July 11.—Virtually no demand is appearing for pig iron, actual sales since the holidays being less than 250 tons. Agencies report that the past week was the quietest on record. Since July 1 operations at mills and foundries have been further curtailed. The Scullin Steel Co. has completed orders it received recently for repair materials for railroads, and has closed down. Stove plants are operating at 20 to 30 per cent of normal capacity, and during the past two weeks report a slight increase in demand. One large interest reported its sales in the past fortnight were double those of the same period immediately preceding. As a rule, however, the stove foundries are accumulating its product for disposal next fall. The Buck Stove Co. is down, but expects to resume on part time about July 15. Job foundries report demand for miscellaneous castings has dwindled to almost nothing. A heat or two per week is ample to dispose of all current orders. Most of these plants are well supplied with pig iron. The large steel industries on the east side, including the National Enameling & Stamping Co. and the Commonwealth Steel Co., have further curtailed activities. A reduction from $4.05 to $3.25 per ton in the freight rate on iron ore from Michigan mines to East St. Louis has been ordered by the interstate commerce commission. This is considered important, especially to the St. Louis Coke & Chemical Co., enabling it to get iron ore on a parity with Pittsburgh, which pays $3.16 to $3.41 a ton freight.

Prices Somewhat Lower

New York, July 12.—Coke prices are lower. Standard beehive foundry coke may be quoted at $4 to $4.50, Connellsville. While coke at $4 is not guaranteed, it is understood that standard coke will be shipped. The northern New Jersey by-product coke maker continues to quote $4.50, Connellsville, on by-product foundry coke for July shipment. Current demand continues of small proportions.

Announce Cut of 25 Cents

Cincinnati, July 12.—Coke prices here appear to have steadied, although a cut of 25 cents a ton, bringing Connellsville foundry to $4 to $4.75 and Wise county furnace coke to $5.25 to $5.75 has been announced here. It is said, however, that all offerings of Connellsville furnace coke loaded in box cars, under $3 have been withdrawn. A Cincinnati dealer last week was offered 500 carloads of foundry coke, open car loading, at $3.50, ovens, to be delivered at the rate of 50 cars a week. When it was found that there was a ready market for the tonnage the offer was withdrawn. A Connellsville producing company which recently shut down 70 ovens at one time has announced that it has contracted for the delivery of a heavy tonnage of coal, covering a long period, at more advantageous prices than would accrue from the manufacture of coke, and that the ovens will be abandoned.

Reduce Spot Prices

Boston, July 12.—A reduction in spot coke prices to the basis of contract prices has been put in effect by the largest New England producer, and has been met by its competitors. Spot coke which has been selling at $11.41 has been cut to $11.16, equivalent to about $4.82 for Connellsville, figuring in a $6.16 freight charge and the 3 per cent war tax. Compared with a range of $4.25 to $5 for Connellsville the price is slightly under that for the best grade of the latter. Producers here state that contracts have been placed at a rate of about 50 to 60 per cent less than when business was at its peak a short time ago. Most of the contracts have been on the basis of price prevailing at time of shipment.

Sellers Not Seeking Contracts

St. Louis, July 11.—The market for coke remains dull and listless. No contracting is being done and producers apparently are not making efforts to induce customers to cover on their future requirements. The St. Louis Coke & Chemical Co., which recently announced a price of $8.50 for its domestic coke, has sold approximately 15,000 tons. By-product stocks are large, and shipments are less than 75 per cent of current production. Prices of standard Connellsville furnace and foundry coke are steady.

Jobbers Take Bar Tonnage

Business Held Up Pending Price Reductions Finally Released—
2.80c Now Quoted on Cold-Drawn Bars

Chicago, July 12.—Recent price reductions on merchant steel bars have led to an improvement in orders and inquiry, although the total tonnage represented is far from satisfactory. The large consumers still hold off. Jobbers who have not been buying in anticipation of lower prices, are placing orders, ranging from a carload to 200 tons. The aggregate during the past week is much larger than in the preceding week. The Illinois Central railroad has an inquiry out for repairs for 140 locomotives, involving a considerable tonnage of soft steel bars.

Orders for bar iron show a slight increase, although inquiry is not expected to develop any appreciable amount of business immediately. Prices are soft, with 2.00c as the high mark. The Republic Iron & Steel Co. continues to operate its East Chicago plant.

In hard bars the situation is much the same. Warehouses are well supplied, and low prices have not developed the business expected. The Inland Steel Co. is operating its Chicago Heights mill, but continued operation is uncertain.

Jobbers Place Orders

New York, July 12.—Steel bar makers say that demand, while still small, has been better during the past few day than for some weeks past. This is due largely to the fact that iron and steel jobbers in this district who were waiting for prices to drop, placed some carload orders after 1.90c, base Pittsburgh, became effective. Manufacturing consumers are not yet ready to buy on a large scale. Mill interests say that considerably higher freight rates and higher costs generally, 1.90c on steel bars is equivalent to 1.00c to 1.05c before the war. They cite this as an indication that not much of a reduction in price can be expected until basic costs are lower.

Jobbers also have closed within the past few days for several carloads of bar iron. However, as iron bars were not included in the general reduction, the business went at 1.90c, Pittsburgh. The market is not active.

Small Lot Orders Increase

Buffalo, July 12.—Sellers of steel bars report a little loosening up of the market since prices were reduced. There has been a good deal of 50-ton business placed on the books, and one inquiry being figured is for 400 tons.

No Improvement Seen

Pittsburgh, July 12.—Since the announcement last week of 1.90c as the new base for merchant steel bars, sufficient time has not elapsed to notice any real increase in demand. Inquiries are for small tonnages, and some of these do not develop into orders, since under curtailed operating schedules, the mills often are unable to make the desired deliveries. Most orders specify immediate delivery. Sizable orders are not being booked in this district. The same is true of refined iron bars. Plant operations are spasmodic. Most current buying is in less than carload lots and of such a character that concessions are not offered, except in certain cases.

Some Business Comes Out

Cleveland, July 12.—Miscellaneous new business in steel bars has been a little better in this territory this week, the price reduction apparently bringing out some business which has been help up awaiting it. An inquiry for 500 tons of bands for work for the Ford Motor Car Co. has been current.

Cold-Drawn Base Now 2.80c

Pittsburgh, July 12.—Leading producers of cold-drawn bars now are naming a 2.80c, base Pittsburgh price, which represents a decline of $6 per ton from the 3.10c price prevailing recently and $4 from the 3.00c, which has been more generally quoted of late. With hot bars at 1.90c this new price allows $18 per ton for conversion. While 2.75c was heard recently, this probably applied only in special instances, but in all probability all makers now will endeavor to obtain 2.80c. Only occasionally do orders reach or exceed single carloads. Releases from automobile companies continue to be received from time to time but practically all have large stocks and confine their purchases to limited tonnages for filling in purposes.

Automobile Maker Seeks 10,000,000 Bolts

Cleveland, July 12.—An inquiry for 10,000,000 bolts from a Detroit automobile maker is the outstanding feature of this market here. The order is expected to be closed this week. The general run of inquiries, while not aggregating anything of size, has given a better tone to the market, strengthening the prices which now are said to be as low as any anticipated steel reduction will permit. Sales being made run into a fair aggregate but are mostly in small lots. Railroads and jobbers are among those inquiring.

The rivet market remains weak with open quotations at 2.75c Pittsburgh, on structural rivets, 2.85c on boiler rivets and 65, 10 and 10 off on small rivets. Lower prices have appeared in this territory where the order has been especially attractive.

Meet Revised Schedule

Philadelphia, July 12.—The eastern nut, bolt and rivet market is weak. Eastern makers generally have revised their price schedules to a basis of 65 and 10 off, Pittsburgh, for large bolts, but some of them even are shading this level. Some sales have been made at 65 and 10 off f.o.b. mill, while some business was taken at this price, delivered.

More Revisions Made

Pittsburgh, July 12.—Further revisions have been made in the prices of nuts and bolts which began to be quoted two weeks ago. Instead of 60 and 5 off, carriage bolts, larger and longer than ⅜ x 6-inch are quoted at 60 and 10 off; machine bolts, with hot pressed nuts, larger and longer than ⅜ x 4-inch, are quoted at 65 and 10 off instead of 60 and 10; while lag screws are quoted at 70 off instead of 65 and 10. An error was made in the price table by quoting machine bolts, rolled-thread, ⅜ x 4-inch with hot pressed nuts at 70 and 10 1-2 off; the correct discount is 70 and 7 1-2 per cent. Full schedules are given on page 130.

While not much business is coming in following the issuance of these reductions, several makers expect a buying movement to develop soon.

Rivets again have receded, structural and boiler rivets being quoted at 2.80c to 2.90c and 2.90c to 3.00c, respectively. Small rivets remain quotable at 65, 10 and 10 off.

Prices Are Unchanged

Chicago, July 12.—The new price in bolts and nuts has little effect on actual quotations in this market, as concessions already made were fully in line with the new levels. Some stabilizing effect is noticeable and a fair amount of buying, especially on the part of the railroads, is expected soon.

Lease Rolling Mill

The newly-erected rolling mill of the Capital City Iron & Steel Co., Harrisburg, Pa., has been leased to Joseph K. White and A. Leigh Ensinger, who will operate it as the Harrisburg Bar Mill Co. At present 9 and 12-inch Belgian mills are in operation and a 16-inch mill is under way. The heating furnaces will be operated with oil for fuel. The power equipment is all electrical. The product will be rerolled iron and steel bars in all commercial shapes and sizes.

The purchase and sales will be in charge of Mr. White who was formerly general sales agent of the Harrisburg Pipe & Pipe Bending Co. and who retired at the time that the former owners withdrew. The operation of the plant will be in charge of Mr. Ensinger who also was formerly connected with Harrisburg Pipe & Pipe Bending Co. and last filled the position of chief engineer.

Hoop Demand Still Slow

Pittsburgh, July 12.—Orders for hoops and bands are not increasing and for the time being are being quoted at 2.50c to 2.60c, base Pittsburgh. A few single carload inquiries are received from time to time from cooperage interests but no large amount of buying is expected to develop before September.

Receivers for Shipyards

The Johnson Shipyards Corp., New York, has been placed in the hands of Maurice P. Davidson and Frank E. Stripe, as receivers in equity, under $20,000 bond. Liabilities are given as $175,000 and assets at $750,000. Numerous suits are pending against the corporation and owing to a shortage of liquid assets, it was stated a receiver-

ship was necessary. The suit was brought by the Liberty Mutual Insurance Co., Boston, a creditor for $13,953. The company is incorporated at $100,000, of which $80,000 is in preferred stock.

Swedish Ore

Sold at 7½ Cents, Sparrows Point—Lake Shippers Make Comparisons

Cleveland, July 12.—Shippers of Lake Superior iron ore are interested in a recent sale of Swedish ore to a large eastern consumer, as an indication of the competitive possibilities of foreign ore at present in that district. A cargo of nonbessemer averaging 65 per cent iron, natural, and 0.17 per cent phosphorus was offered in the open market and sold at 7½ cents per unit, or $4.87½ per ton, delivered Sparrows Point. On the analysis given, the price of a similar grade of Lake Superior ore would be $6.35, delivered at lower lake port. This with freight to Sparrows Point would bring the delivered cost to $8.66, or 13.3 cents per unit, amounting to $3.78½ more per ton than the Swedish ore.

The cargo was about 10,000 tons and is said to have been brought over as ballast, without consignee being named. Eastern consumers were not in need of the ore, and Lake Superior shippers class it as a "distress" sale. At present freights, ore can be shipped 4250 miles in Atlantic freighters for 8 shillings, or about $1.60 per ton. This is 71 cents less than the rail rate from lower lake port to Sparrows Point. Spanish ore is being offered at tidewater at 8 to 9 cents per unit.

The market is devoid of inquiry and sellers are having difficulty in negotiating with regular customers. A large consumer in Youngstown has agreed to take one-sixth of the tonnage it took last year, though it considers this amount will exceed its requirements. A number of furnace companies having long term contracts do not want to take the minimums specified, and in one instance, the shipper was urged to first make an effort to dispose of the tonnage at resale. The Ford company has not placed the tonnage for which it was negotiating. A shipper who received an inquiry from a customer for 50,000 tons reports that the prospective purchaser is not interested.

Receipts of ore at Lake Erie ports in June amounted to 2,774,580 tons, the total for the season to July 1 being 4,455,480 tons. Shipments from Lake Erie ports to interior furnaces to July totaled 3,746,667 tons. The balance of ore on dock July 1 was 8,417,725 as compared with 7,005,050 a year previous. Lake front furnaces at Lake Erie ports received 647,177 tons to July 1, compared with 2,561,690 tons received to July 1, 1920.

Deliver Ore at 13 Cents

New York, July 12—A moderate tonnage of 60 per cent bessemer concentrates has been bought by an eastern Pennsylvania blast furnace at a price figuring out to about 13 cents a unit, delivered. Foreign ore continues to be offered at 8 to 11 1-2 cents per unit, tidewater, depending on the grade. Prices generally are nominal owing to lack of sufficient business to test the market.

Plate Business Picks Up

Larger Tonnage Placed and in Prospect Than in Many Weeks—Demand Coming From Several Lines—Eastern Makers Offering 1.85 to 1.90c

Philadelphia, July 12.—More plate business has been placed in the week than for some time. The East New Jersey Pipe Co. booked a pipe contract for the city of Philadelphia, involving 1000 tons of plates. The Baldwin and the American locomotive works divided an order for 60 locomotives for Mexico. The Baldwin works bought 750 tons of plates and the American will buy the same tonnage. These companies are expected to book 50 more locomotives for Mexico. Hughes, Foulkrod & Co. were low bidders for the Wilmington marine terminal, involving 3000 tons of plates, shapes and bars, but Snare & Triest may get some of the work. The Merchant Shipbuilding Corp. has not yet bought 400 tons of plates for two fire tugs for Philadelphia. Action is expected soon on two boats for the Red D line on which several shipyards are bidding. The Reading railroad is inquiring for 200 to 300 tons of plates and shapes. The Pennsylvania railroad is expected to place several thousand cars for repair shortly, or to buy material for doing the work in its own shops, but so far there is nothing definite. Eastern mills are interested in a contract the Pittsburgh-Des Moines Steel Co. took for 14 tanks for the shipping board, involving 3000 tons of plates. The Midvale Steel & Ordnance Co. is operating one mill single turn at Coatesville. The Lukens Steel Co. is operating three mills single turn; the Central Steel Co. one mill single turn and the Worth Steel Co., one mill single turn. The Alan Wood Iron & Steel Co. mill continues idle. The most attractive business placed during the week went at 1.85c and 1.90c, base Pittsburgh. The 2.00c price apparently is reserved for smaller tonnage.

Books 1400 Tons

New York, July 12.—Plate demand here is not sufficient to test the market. It is not at all certain what prices could be done if a large order were obtainable. Current buying is comprised entirely of small lots. In the majority of cases the current price is 2.00c, base, Pittsburgh. The largest orders placed during the past week involved under 100 tons each, and the buyers said they were unable to secure a price less than 1.90c.

The Lukens Steel Co. has booked 1400 tons of plates for stills for the Standard Oil Co. of New Jersey.

Car Jobs May Release Tonnage

Pittsburgh, July 12.—While some plate makers continue to quote 1.90c, base Pittsburgh, the leading producers are quoting 2.00c. Only small inquiries are current, and while railroad repair work is creating some plate business in other districts particularly Ohio, Illinois, Indiana and elsewhere, in this locality this character of demand yet remains to be developed, although there is some little tank car work current. The Youngstown Steel Car Co., Niles, O., has been asked to bid on repairs for 2000 cars for the Erie railroad and this probably will mean some plate tonnage.

The Riter-Conley Co. has booked seven tanks for the Southern Pennsylvania Oil Co., Fairmount, W. Va., involving 2000 tons of plates.

Pipe Line Bids Rejected

Cleveland, July 12.—All bids for a riveted water line at Akron, O., requiring 2800 tons of plates have been rejected. This action is attributed to the lower prices announced this week. Reports of concessions on plates below 2.00c Pittsburgh have not ceased with the mills' formal adoption of the latter figure. A lot of 275 tons of plates and shapes for southern Ohio delivery is understood to have gone jointly at 1.90c Pittsburgh. The mill taking the business however, insistad on 2.00c Pittsburgh if the plates or shapes were placed singly.

Refuse New Concessions

Chicago, July 12.—Price reduction and stabilization are beginning to be reflected in the plate market. Buyers seem more interested and makers in this district report better inquiry. Tonnage business, however, is not in sight. Offers of moderate lots at prices below the new levels have been refused by local mills. The Standard Oil Co.'s tonnage for tanks for a southern plant has been indefinitely postponed.

Open-Hearth Output in Valley Reduced

Youngstown, O., July 12.—Valley operations this week continue at a low ebb with only 20 per cent of independent open-hearth capacity engaged. This is 11 per cent less than a week ago. The Trumbull Steel Co. and the Sharon Steel Hoop Co. are operating three open-hearths each, and the Brier Hill Steel Co., four.

Despite the fact that a new wage agreement was signed by the Amalgamated Association of Iron, Steel and Tin Workers and the Western Sheet and Tin Plate Manufacturers association last Saturday, this week began with only 21 per cent of valley capacity under power. This is a 4 per cent gain over last week's schedule. Of the 22 sheet mills in operation the Newtown Steel Co. has 10 and the Trumbull Steel Co. and the Brier Hill Steel Co., six each.

The Brier Hill Steel Co. also is operating its 132-inch plate mill. Five tube mills are working, two at the Youngstown Sheet & Tube Co. and three at the Republic Iron & Steel Co. Blast furnace operation continues at 22 per cent of valley capacity. No. 1 furnace of the Farrell, Pa., group of the Carnegie Steel Co., now is ready for another campaign after having 13 feet of top brickwork replaced.

Scrap Prices Go Lower

Reductions Reported Generally in All Markets, Cut Ranging from 50 Cents to $4—Transactions Few—Buyers Show No Interest

FOR COMPLETE SCRAP PRICES SEE PAGE 126

St. Louis, July 11.—No change for the better has appeared in the scrap market. Industries as a unit are out of the market so far as purchasing is concerned, and dealers are confining their operations to picking up bargains for storing or covering short contracts. The trend of prices continues downward, specific reductions having been made in four items during the week, and no advances. The railroads continue to sell their scrap in spite of the fact prices realized are the lowest thus far recorded. The Pennsylvania disposed of 5300 tons. Lists before the market in the week included Missouri, Kansas & Texas, 1100 tons; Mobile & Ohio, 800 tons and the Union Pacific, 1200 tons. Rerolling rails sold in the week at $11 per ton, a new low on the movement. Iron car axles were marked down $1 to $17 and $17.50. Cast grades are unsalable. Reports from the country indicate less agricultural scrap has been accumulated this year than in more than a decade. The low quotations and high freight rates have virtually killed the country scrap business.

Business At Lowest Point

Philadelphia, July 12.—Some dealers say their scrap business in the past week was the smallest in their history. Current sales are comprised entirely of miscellaneous carload lots for both consumers and dealers. Prices of railroad wrought, wrought pipe, blast furnace borings, turnings, heavy axle, forge turnings and cupola cast are 50 cents to $1 lower.

Market Without Demand

Pittsburgh, July 12.—Curtailed operations continue to exercise a deterrent influence upon the scrap market, which virtually is devoid of demand. What little sales are made on a hand-to-mouth basis, although the Union Steel Castings Co. closed upon a round tonnage of low phosphorus billet and bloom crops at $15, reducing the quotable market on that grade by $1 to $15 to $15.50. This company likewise bought some knuckles and couplers, paying $14, whereas lately these grades have been quotable at $12.50 to $13, or 50 cents above heavy melting steel along with railroad coil and leaf springs. Other reductions of 50 cents per ton are noted on heavy axle turnings. compressed sheets, bundled sheets, cast iron borings, while $1 per ton is taken off the quotations on No. 1 cupola cast, old iron axles and No. 1 railroad wrought. Some of these lower quotations are understood to be fixed by recent railroad awards on bids filed on monthly lists.

Revised Prices General

New York, July 12.—Scrap prices have again undergone a reduction, only a few descriptions not being marked down 50 cents to $1. On some materials, such as borings and turnings, the prices dealers are offering are less than the freight charges to point of consumption. Very little business, however, is being done, so that prices largely are nominal.

Scrap Users Well Supplied

Buffalo, July 12.—The mills which are now in operation seem to be so well provided for in comparison with their scrap needs, that little buying is looked for in the immediate future. A stalemate is evident as between dealers' transactions. No demand is shown and dealers are making little effort to liquidate at present low prices. A little business in turnings is emanating from westerly points, but prohibitive freight rates do not make this an attractive proposition. Reduction of the little open-hearth capacity that was in operation here will further deaden the market.

Prices Cut Heavily

Cincinnati, July 12.—Iron and steel scrap prices declined today when wholesale dealers here made a sweeping downward revision of current schedules. The cuts ranged from 50 cents to $4 a ton on various grades. The market is the dullest known in a number of years. Spot buying has entirely disappeared and there are no new inquiries out. Nothing has developed from inquiries current last week.

Buyers Show No Interest

Chicago, July 12.—Scrap buyers are without interest and prices therefore are of little importance. Iron rails are down $1.50 and rerolling rails are down 50 cents. Railroads continue to offer some tonnages. This week the Pere Marquette offered 1700 tons and the Northern Pacific 1300 tons. Total sales in this district are lower than they were a week ago.

Semifinished Sales

Are Exceedingly Few—$30 Offered On Sheet Bars— Rods At $42

Pittsburgh, July 12.—Almost a total absence of inquiry for semifinished materials, is noted among leading producers here. The reduction of $4 per ton inaugurated a week ago on sheet bars, 4 x 4-inch rerolling billets, smaller billets and slabs, by the leading eastern independent has failed as yet to stimulate demand to any noticeable extent. This decline brought prices on these products to $35, $33, $35, and $34, base Pittsburgh, respectively. With usual differential of $5 over 4 x 4-inch rerolling billets, the price on forging billets is $38, while wire rods in some instances are being quoted at $42 to $43, although some producers believe that is too low and have not settled upon a new base price. The old one was $48. The leading wire producers is quoting $42, Pittsburgh on rods. Increased operations among pipe mills have not become necessary and the sale of skelp is limited, even at the $4 per ton reduction or the 2c, base Pittsburgh price now quoted.

Market Not Tested

Philadelphia, July 12.—Semifinished material generally is regarded as being fixed at the prices announced last week by the Bethlehem Steel Co. while some inquiries for rolling and forging billets have been before the trade there has not been any real intention to buy, and no market test is afforded.

All on Same Price Basis

Youngstown, O., July 12.—While all valley makers have reduced quotations on semifinished material in line with those announced July 7 by the Steel corporation, their action has had little effect on the market as far as stimulating business is concerned. The market is lacking in inquiries for slabs and billets. Little demand exists for sheet bars. Billets 4 x 4 inches and larger are quotable at $33, slabs at $34 and sheet bars at $35, Youngstown.

Low Price Is Offered

Cleveland, July 12.—A buyer in this territory has been seeking 500 to 600 tons of sheet bars and has offered a price of $30 Pittsburgh on the claim that this figure had been quoted. If such a price has appeared, it is believed to be on resale steel. No other interest of consequence in semifinished material is apparent among buyers in this territory. Wire rods now are quoted at $42 to $43 Pittsburgh, the lower figure being named by the leading producer. Very little rod business has been booked lately. Forging billets are particularly inactive, local consumers being well stocked.

Lower Warehouse Prices to New Levels

Philadelphia, July 12.—Prices on iron and steel out of stock here have been reduced horizontally. Iron bars and iron bands have been lowered 10 cents and steel bars, bands, shapes and plates have been reduced 25 to 30 cents per 100 pounds. Tinplate is 50 cents lower and terne plate has been reduced $1.70 per double box. Cold rolled rounds are 10 cents lower, while cold rolled flats, squares and hexagons, as well as steel hoops, are unchanged. Blue annealed sheets are 20 cents lower, but black and galvanized sheets are unchanged from the last reduction. The differentials formerly prevailing between the local and out-of-town shipments have been waived and prices now are the same for all points. Jobbers say business generally shows no improvement and continues at the rate of about 30 per cent of last year's average.

Prices Near Uniform Level

New York, July 12.—Following recent price reductions by the United States Steel Corp. and the independent mills, local jobbers have made further downward revisions. Bars, shapes, plates, sheets and cold-rolled materials were among the products affected. With the exception of cold-rolled prices, quotations, as quoted by the jobbers generally, are near a uniform level. On cold-rolled materials, conces-

sions are being offered by one or two jobbers. A number of odd lots, representing cancelled export business, are before the market, but despite material concessions, little appears to be moving.

Cuts Made In Prices

Cleveland, July 12.—Reductions have been made in several steel products by local jobbers to conform to new mill schedules. Galvanized sheets now are quoted 5.25c to 5.50c; black, 4.25c to 4.50c; blue annealed, 3.40c to 3.50c; bars, 2.79c; shapes, 2.89c; tin plates, $15 per ton lower; galvanized and wire nails, $5 per ton lower, and hoops and bands $4 a ton lower.

Prices Are Marked Down

St. Louis, July 11.—Declining prices are the rule in the warehouse steel market. Steel bars have been cut from 3.22½c to 3.02c; shapes from 3.32½c to 3.12½c; plates from 3.32½c to 3.12½c; No. 10 blue annealed sheets from 3.97½c to 3.77½c; No. 28 black sheets from 5.25c to 5.00c and galvanized sheets from 6.15c to 6.00c. The cuts have not resulted in any noticeable increase of demand.

Follow General Revisions

Pittsburgh, July 12.—Leading mill interests operating warehouses in this city have reduced prices on material from store in line with lower mill figures. Plates, shapes and bars have been reduced $4 a ton, plates and shapes to 2.65c and bars to 2.55c.

Open Cotton Tie Market at $1.35, 1916 Price

Pittsburgh, July 12.—The cotton tie price for the season of 1921, as announced by the Carnegie Steel Co., last week is the same as it was in 1916, namely $1.35 per bundle of 45 pounds. The announcement came this year about a month later than usual, last year's being dater June 7 while that of the year before was dated June 17. The late opening is due to the poor demand, the cotton crop being far below normal. One of the large independent producers here, however, recently arranged for transportation by water to New Orleans, La., for about 400 tons of cotton ties. The comparative price for cotton ties annually since 1902 follows:

1902	$0.80
1903	.85
1904	.75
1905	.85
1906	.85
1907	.95
1908	.85
1909	.70
1910	.75
1911	.75
1912	.70
1913	.80
1914	.65
1915	.85
1916	1.35
1917	2.10
1918	1.90
1919	1.70
1920	2.00
1921	1.35

The average yearly price for the 10 years from 1904 to 1913 inclusive, was 79 1-2 cents and the average yearly price for the five years from 1916 to 1920 inclusive was $1.81, the peak being reached in 1917 with $2.10.

Sheet Buyers Mark Time

Little Activity Noted Since Reduction—Some Makers Continue To Cut Prices—Several Inquiries Current

Pittsburgh, July 12.—The new prices on sheets appear to be firmly held as far as new production is concerned. Concessions are noted on certain stocks of both black and galvanized which holders are endeavoring to liquidate. This is particularly applicable to certain galvanizers who buy their black sheets and do their own galvanizing, which practice is being interfered with by the present high freight rates. New buying since reductions were announced has been light, although some specifications were immediately released when the 2.65c, 3.50c and 4.50c, base Pittsburgh prices become effective on blue annealed, black and galvanized sheets, respectively. This decline is the second since the middle of June, the other cut of like proportions having become effective June 17 or shortly thereafter. Present demand is not sufficiently sizable to change the tone of the market, although mill operations probably will pick up now that the settlement has been reached with the Amalgamated Association of Iron, Steel and Tin Workers. Among certain nonunion independents and the leading interest, operations have been slightly increased since the first of the month, due to a few orders being received for various kinds of sheets.

Buys 500 Tons of Black Sheets

New York, July 12.—A large stamping and enameling company has just bought 500 tons of black sheets at 3.25c base Pittsburgh.

Eastern Makers Cutting Prices

Philadelphia, July 12.—Severe price cutting features the sheet market in this district. The West Penn Steel Co. at a public opening of bids in Trenton, N. J., took 30 tons of special finish black sheets for automobile license plates at 3.10c, base Pittsburgh. The largest inquiry in some time is from Belmont Iron Works which wants 1300 tons of painted corrugated black sheets for government hangars. Keen competition is expected for this order. Mills are taking orders right along for stock sheets at 4.25c, base, for galvanized, and 3.25c, base, for black. Some cutting is reported in blue annealed but there is not enough buying to test the market in the grade.

Wants 800 Tons of Annealed

Youngstown, O., July 12.—Little improvement is noticed in the sheet market. Operating schedules continue at a low ebb, the week starting off with valley mills rolling at 21 per cent of capacity. Makers generally are quoting 2.65c on blue annealed, 3.50c on black and 4.50c on galvanized, the prices recently announced by the Steel corporation. While little business has resulted from the lower prices, it is felt that more time should transpire before any conclusion can be drawn. Two interests report inquiries more numerous the past week; others, however, state business is as dull as at any time over a period of years, with inquiries lacking. One of the largest inquiries received in this district in many weeks is one for 800 tons of 12-gage blue annealed, wanted by a Chicago consumer. This business is pending.

Orders Slightly Lower

Chicago, July 12.—Less than carload lots rule in the sheet market in the West. Demand is scattered and while indications point to better conditions later in the summer nothing of immediate interest is in sight. Production at mills in this district has not changed, but total tonnage on order is thought to have dropped off slightly.

Cold Strip Cut $15

Pittsburgh, July 12.—Makers of cold rolled strip steel including the American Steel & Wire Co. have reduced prices $15 per ton as from 5.00c to 4.25c, Pittsburgh. Hot rolled strip remains quoted at 2.50c to 2.60c, in the absence of a definite announcement as to a new price. The demand continues of the same general character prevailing for some time past, with purchases on a hand-to-mouth basis, although small inquiries are fairly numerous. Most of these are directly or indirectly related to the automobile industry. Cold mills are being operated as indicated by the order books, while hot mills are operated steadily for a week or so after orders accumulate and then are shut down. Several small inquiries recently were received from New England territory and one company now is at work upon an inquiry for about two carloads for export.

Southern Stocks Lower

Pig iron stocks in the Birmingham district on hand June 30 totaled 232,912 tons, a decrease of 2250 tons from May. Foundry grades amounted to 123,380 tons compared with 132,002 tons as of May 31. Basic, however, shows an increase of 2798 tons, the amount on hand being 61,756 tons and 58,958 tons June 30 and May 31 respectively. Warrant stocks now are exhausted. Machine cast iron stands at 47,776 tons compared with 44,202 tons at the end of May, an increase of 3574 tons. The Sloss-Sheffield Steel & Iron Co. and the Gulf States Steel Co. each blew out a stack June 30 leaving seven furnaces in blast throughout the district. Five of these are on basic and two on foundry iron. Thirty-one stacks are out of blast owing to business conditions.

Defer Ferro Hearing

New York, July 12.—The defense in the ferromanganese dumping proceedings brought by the federal trade commission against Crocker Bros. and C. W. Leavitt & Co., New York, and Frank Samuel, Philadelphia, scheduled to be heard July 12, has been postponed a week owing to the illness of the consul for the respondent. The hearing now is scheduled for Tuesday, July 19, at the new New York headquarters of the trade commission.

Shapes Inquiries Increase

Aggregate Tonnage Not Large, However—2500 Tons Placed in South—Several Sizable Jobs Pending—Government Projects Included

Chicago, July 12.—While the volume of business let during the week is low, inquiry has improved and structural companies are almost universally of the opinion the situation as a whole is better. Prices are still erratic, and some of the recent jobs show mills are still anxious for work. The mechanical repair shop for the government at Leavenworth, Kans., was awarded to the Merks Bros. Construction Co., St. Louis, and the steel contract calling for 550 tons was let to the Missouri Valley Bridge & Iron Co., Leavenworth. The price for this steel fabricated and delivered is something under $73 per ton, which, considering the high freight rate is unusually low. Bids were opened Friday on the Federal Reserve Bank building at Minneapolis, Minn., calling for 800 tons, but no award has been announced. Contracts let during the week include a high school building at Salt Lake City, 217 tons, and the Selwyn & Harris theater building, Chicago, 348 tons.

Volume Not Large

Boston, July 12.—Slightly increased inquiries for structural steel were reported during the past week, but there was little to arouse enthusiasm over the volume. Most of this business is for repair work and replenishing stocks.

The Saugus River bridge proposal which was expected to take 600 tons has been abondoned, the commission having decided to erect a temporary wooden structure.

Books Sheet Piling

Buffalo, July 12.—Encouraging business in sheet piling is being done by one Buffalo mill which during the past month has booked between 4000 and 5000 tons of this product.

Navy Takes Tonnages

Pittsburgh, July 12.—Government work figures largely in recent bookings of structural shapes. Among a large number of small jobs let to various independent shape producers and fabricators, as well as the American Bridge Co., the McClintic-Marshall Co. took a machine shop at San Diego, Cal., and a carpenter and machine shop for the bureau of yards and docks, navy department, involving 175 and 230 tons respectively. This company likewise received the award from the Oregon state highway bridge commission for a 350-foot arch span bridge over the Williamette river at Oregon City, involving approximately 500 tons of plates and angle bars. A tonnage of reinforcing concrete bars likewise will be required in its construction. Numerous projects still are held in abeyance. While reports of shading under the 2.00c base Pittsburgh level established one week ago on structural shapes by the Bethlehem Steel Corp., and since followed by other independents as well as the Carnegie Steel Co., are common, these are not directly traceable and it is understood an effort is being made by makers to hold firmly at 2.00c. Some of the smaller companies, however, are quoting 1.90c on attractive tonnages.

2500 Tons Are Placed

Cleveland, July 12.—News of the award of 2500 tons of steel for a factory for the United States Sheet & Window Glass Co. at Shreveport, La., to the Decatur Bridge Co., Decatur, Ill., has been received with interest here where a number of fabricators had figured on the project. It was learned the successful bid was on a basis of $70 per ton delivered. Interest now centers in the possible award this week of 4000 tons of fabricated steel for the Ohio stadium at Columbus, the general contract having been awarded last week to the E. H. Latham Co., Columbus. An award of 300 tons for a bank at Canton, O., also is pending. Reports continue that less than 2.00c Pittsburgh is possible for attractive orders for shapes and one combination lot of plates and shapes is said to have gone at 1.90c.

The Austin Co. has taken a Los Angeles harbor job requiring 500 tons.

May Place 400 Tons Soon

Philadelphia, July 12,—Requirement at Belmont, N. Y., for government hangars is provided a real test of the shape market. This business involving 4000 tons of shapes and 500 tons of plates as well as tonnages of sheets and bars is expected to be placed shortly. The shapes are expected to go well under 1.90c base Pittsburgh.

Awards Aggregate 3000 Tons

New York, July 12.—Structural orders placed of late aggregated possibly little more than 3000 tons. The largest involved 750 tons for the Easton junior high school, Norfolk, Va. New inquiry included 800 tons for a bridge for the Central Railroad of New Jersey, 1000 tons for a highway bridge at Manchester, N. H., and 1000 tons for a normal training school at Cortland, N. Y. Prices on steel fabricated and erected for commercial buildings are around $85 a ton. Shapes are quoted at the mills at 2.00c, Pittsburgh. Lower prices are reported as having been done but actual confirmation is difficult. One large trade interest expressed the opinion that on a substantial lot, 4000 or 5000 tons, a material reduction under the 2.00c, Pittsburgh, price could be done. The closing date on bids on the general contract for the Federal Square building, involving 5000 tons, has been postponed.

CONTRACTS AWARDED

Machine shop and engine house, Marine bay, San Diego, 178 tons; to McClintic-Marshall Co.

Carpenter and machine shops, Hampton Roads, Va., bureau of yards and docks, navy department, United States government, 230 tons, to McClintic-Marshall Co.

Oregon State Highway commission, Oregon City, Oreg., bridge over Williamette river, 500 tons, to McClintic-Marshall Co.

Leavenworth mechanical repair shop, 550 tons, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

Selwyn & Harris theater building, Chicago, 348 tons, to Vanderkloot Iron Works.

Main building of West high school, Salt Lake City, Utah, 217 tons, to Minneapolis Steel & Machinery Co.

Five highway spans, Taylorville, Ill., 157 tons, to Decatur Bridge Co.

Beams for Twelfth street bridge, Boulder, Colo., 125 tons, to American Bridge Co.

Harbor work, Los Angeles, 500 tons, to the Austin Co., Cleveland.

Factory building, Shreveport, La., for the United States Sheet & Window Glass Co., 2500 tons, to the Decatur Bridge Co., Decatur, Ill.

Ohio stadium, Ohio State university, Columbus, O., 4000 tons, general contract to E. H. Latham Co.

Garage Washington Square, New York City, 200 tons, to Patterson Bridge Co.

Catholic school, Brooklyn, 200 tons, to George A. Just.

Transfer tables for Lehigh Valley railroad, 500 tons, to the Bethlehem Steel Bridge Corp.

Bridge for Delaware, Lackawanna & Western railroad, 275 tons, to Bethlehem Steel Bridge Corp.

Theater on Manhattan, New York City, 200 tons, to the National Bridge Co.

Easton junior high school, Norfolk, Va., 750 tons, to Bethlehem Fabricators.

Telephone exchange, Philadelphia, 250 tons, to the Monteray Iron & Steel Co.

Canal warehouse, Rochester, N. Y., 375 tons, to Lackawanna Bridge Co.

Bridge work for the Kanawha & Michigan railroad, 800 tons to the Mt. Vernon Bridge Co.

CONTRACTS PENDING

Pittsburgh warehouse for Crane Co., Chicago, 825 tons; general contract to Bates & Rodgers Construction Co., Chicago.

High school building, Jeanette, Pa., general contract to Standard Construction Co., Philadelphia.

Federal Reserve Bank building, Minneapolis, 800 tons, bids taken.

Highway bridge, Manchester, N. H., 1000 tons, again up for bids.

Bridge for Central Railroad of New Jersey, 800 tons, revived.

Normal training school, Cortland, N. Y., 1000 tons, general contract just awarded.

Transmission tower line, Pacific Gas & Electric Co., 1800 tons; bids to be opened July 18.

Bank Requires Concrete Bar Tonnage

New York, July 12.—Most interest in the concrete reinforcing bar market here centers around the 1700 tons to be required in constructing the foundation of the proposed Federal Reserve Bank building here. The Foundation Co. has the contract for this work and will buy the bars. Several other jobs involving 200 to 400 tons of bars are pending. Rodgers & Haggerty, New York, have the general contract for the proposed bridge at Bethlehem, Pa., requiring about 1700 tons of bars. The market on concrete bars here is regarded as 1.85c to 1.90c, base, Pittsburgh.

Keen Competition Expected

Cleveland, July 12.—Keen competition is expected on 1000 tons of reinforcing bars for the Ohio State university stadium, Columbus, O., the general contract for which was awarded this week to the E. H. Latham Co., Columbus. The 1750 tons for the Baldwin reservoir, this city, are tied up in court proceedings. New steel bars for reinforcing are quoted at 1.90c Pittsburgh and rerolled bars around 1.75c mill.

Adjust to New Base

Pittsburgh, July 12.—Settling to the new base, 1.90c, base Pittsburgh, reinforcing concrete bar proposals largely are being revised, although some

small lots which makers are able to deliver immediately are bringing 2.00c. Only a few small orders have been placed at the new basis, however, the largest possibly involving one or two carloads. A undetermined tonnage of reinforcing concrete bars will be required in the Oregon City bridge for the Oregon state highway commission over the Willamette river, the contract for steel plates and angles having been awarded the McClintic-Marshall Co. recently.

CONTRACTS AWARDED

Ohio stadium, Ohio State university, Columbus, O., 1000 tons, general contract to E. H. Latham Co.

CONTRACTS PENDING

Foundation for Federal Square building, New York, 700 tons, general contract to Foundation Co.

Filtration plant, Norfolk, Va., 350 tons, bids being taken.

Troy-Cohoes bridge, New York state, 30 tons bids being taken.

Carpet factory, Amsterdam, N. Y., 400 tons, bids being taken.

Athletic Club building, Newark, N. J., 200 tons, bids being taken.

Bridge for Philadelphia & Reading railroad, general contract to Rodgers & Haggerty, New York City.

New Prices

On Wire Bring Increased Specifications in West—No Response in East

Pittsburgh, July 12.—That producers of wire and wire products are right in their contention that lower prices do not create any sizable business is evidenced by the fact the last cut of $5 per ton, in force for the past week, has not been followed by measurably increased operations among the wire mills here. Present activity mostly is confined to the revision of outstanding quotations, new inquiries being at an extremely low ebb. This decline, the second in the past few weeks and the third in connection with galvanized products, amounting to $5 per ton, places the price on wire nails at 2.75c; plain wire, 2.50c; galvanized wire, 3.00c; barbed wire, painted, 2.90c; barbed wire galvanized, 3.40c; polished staples 2.90c and galvanized staples, 3.40c, while coated nails are quoted at 2.35c.

Future Looks Brighter

Chicago, July 12.—Many factors at present point to an early resumption of activity in wire nails. Stocks are universally low. Rural districts have been holding up buying for nearly a year and are in need of supplies. The 25-cent per 100 pounds reduction put in effect by the American Steel & Wire Co. is expected to give confidence to the trade and stimulate buying. The railroads are looked to as a probable outlet for tonnage. Already jobbers serving the country trade are starting to increase buying.

Better Specifications

New York, July 12.—Mills which got out the reduced price schedules a week ago report their announcements have resulted in improved specifications from consumers of wire and nails. Whether this marks the inception of a somewhat larger volume of business generally is not yet known. The market generally now is 2.75c, base, Pittsburgh, on wire nails and 2.50c, base, Pittsburgh, on plain wire.

Railroad Repairs Active

Work in Northwest Believed To Presage Some Buying—Grain Outlook Bright—Track Material Inquiries Increase—Purchasing Quiet

Chicago, July 12.—Repair work for nearly all of the Northwest railroads is progressing at close to 100 per cent of shop capacity, and buying is looked for at almost any time by the principal mill interests. One authority, who has just returned from a trip throughout the Northwest, reports a decidedly cheerful attitude on the part of railroad executives. The bulk of the repair work on most roads is in wooden cars, and while for this construction some fairly large orders for malleable castings are in prospect, the steel requirements are small. Several roads have recently started locomotive repairs, and at least two roads are in the market for steel for this work. The Illinois Central is said to be the most active buyer. The Northern Pacific, the Great Northern and the Soo Line are active in repair work, and are expected to be early buyers. The grain situation has suddenly changed during the past few days for the better. The hot spell which threatened to cut down the wheat yield, was relieved throughout the entire Northwest by heavy rain. Corn also gives promise of a heavy yield, and railroads look to this traffic as one of the big profitable features in the near future.

Receives Canadian Rails

New York, July 12.—The Bethlehem Steel Co. has booked 4000 tons of girder rails and 500 tons of T-rails from the city of Toronto. The American Locomotive Co. has booked 27 locomotives for the National railways of Mexico and 24 others for export, principally to the Orient. As a result, the Brooks plant at Dunkirk will resume part time operations shortly.

Small Orders Booked

Pittsburgh, July 12.—Light rails are quotable at a 2.00c, base Pittsburgh level, in line with the $4 per ton reduction made in other steel products. Some producers claim still to be quoting 2.20c, base Pittsburgh. Only a few small carload orders are being booked mostly from coal mine districts. Light rail business for the first half with some important producers totaled the largest in five years.

Railroad spikes now are quoted at 3.00c, base Pittsburgh, with a few inquiries, involving single carloads mostly.

Several inquiries recently were received by makers of track bolts who continue to quote 4.00c to 4.20c, base Pittsburgh. Several railroads have entered the market for single carloads. The Rock Island recently inquired for more but so far as learned, the order has not been placed. The Southern Pacific is inquiring for 3000 kegs of track bolts. This company's former order for 800 kegs went to the Colorado Fuel & Iron Co.

Since no reduction in new rails was announced along with other price cuts made recently, relaying rails show no decline and continue quotable at $30 to $35, the minimum being lowered since a week ago to take in some recent quotations on 60-pound sections.

To Open Bids on 500 Cars

Philadelphia, July 12—The Bangor & Aroostook railroad opens bids July 21 on 200 flat cars and 300 box cars. The Illinois Central is inquiring for 150 locomotives. The Baldwin Locomotive Works and the American Locomotive Co. each booked 25 locomotives for Mexico and are expected to divide another 50 for the same country.

Some Releases

Given on Tin Plate at Lower Prices Canmakers Have Stocks

Pittsburgh, July 12.—The receipts of a few tin plate releases, none of which can be said to be sizable is practically the only effect noted upon the market by the decline of $10 per ton which was announced a week ago today by the Bethlehem Steel Corp., and promptly followed by independent producers and the American Sheet & Tin Plate Co. This brought the price per base box of 100 pounds, Pittsburgh, to $5.75 for production plate, or the price at which stock plate had been selling for some time past. Stock plate is being offered at various figures under that level at present. One of the leading independents in this district which added six to its eight active tin mills last week is maintaining this increased rate of operation and states that orders and specifications now in hand are sufficiently sizable to keep up this schedule for a month or six weeks without additional business. Some of the releases referred to came in from food and vegetable packers and some direct from canmakers. New buying necessarily is limited and it is understood that canmakers generally have large stocks of tin plate on hand. This latest reduction of $10 per ton follows the reduction of $15 per ton, announced April 13 by leading producers and brings the price $2 per ton below the industrial board price of March 21, 1919.

Larger Specifications Received

New York, July 12.—Demand for tin plate is increasing in volume in this district. Some users, including manufacturers of tin cans, metal corks, etc., find that demand for their products is larger than they expected. They are increasing their specifications on contracts. In some cases the mills will have difficulty in getting shipment forward as rapidly as the consumers desire. The consumers involved include some companies who were anxious to liquidate their inventories, and it now looks as though they carried this policy a little too far. All of the makers now regard the tin plate market as $5.75, per base box, Pittsburgh.

Pipe Reduced $2 to $12

Increased Demand Fails To Result Following Cut—Cast Grades Show Some Renewed Activity in the West

Pittsburgh, July 12.—Little change in demand is shown in the tubular market as the result of reductions of $2 to $12 per ton in iron and steel pipe and boiler tubes announced by all the producers in the past week. Some fair miscellaneous business is being placed but the aggregate is light.

The A. M. Byers Co. issued a new card on iron pipe July 9 which registered a decline of $2 on ¼ and ⅜-inch, $8 on ½ to 6-inch and $12 on 7 to 12-inch. The new card on standard wrought iron pipe follows:

	Black	Galvanized
Standard Wrought		
¼ and ⅜-inch.....plus	1½	buttweld plus 27½
½-inch	31½	buttweld 13½
¾-inch	37½	buttweld 22½
1 to 1½-inch.....	39½	buttweld 24½
2-inch	34½	lapweld 20½
2½ to 6-inch.....	37½	lapweld 24½
7 to 12-inch.....	35½	lapweld 22½
Extra Heavy Plain Ends		
¼ and ⅜-inch.....plus	9½	buttweld plus 42½
½-inch	30½	buttweld 18½
¾-inch	37½	buttweld 23½
1 to 1½-inch.....	39½	buttweld 25½
2-inch	35½	lapweld 22½
2½ to 4-inch.....	38½	lapweld 26½
4½ to 6-inch.....	37½	lapweld 25½
7 and 8-inch.....	30½	lapweld 18½
9 to 12-inch.....	25½	lapweld 13½
Double Extra Heavy, Plain Ends		
½-inch .....plus	32	buttweld plus 44
¾-inch .....plus	12½	buttweld plus 24½
1-inch .....plus	28½	buttweld plus 40½
1¼-inch .....plus	12½	buttweld plus 24½
1½-inch .....plus	11½	buttweld plus 23½
2 and 2½-inch.....	2½	lapweld plus 9½
3 to 4-inch.....	7½	lapweld plus 1½

The declines in standard steel pipe, announced one day earlier by the National Tube Co., with a card, dated July 7, are as follows: $2 per ton on ¼ and ⅜-inch, $4 on ½ to 6-inch and $6 on 7 to 12-inch. Steel pipe in sizes above 12-inch has declined $4 per ton. The National Tube Co.'s new card, which is being adopted by independent producers, is as follows:

	Black	Galvanized
Standard Pipe		
Jobbers' car loads		
⅛-inch, buttweld	50½	24
¼ and ⅜-inch, buttweld.....	53½	27
½-inch, buttweld	58½	44
¾-inch, buttweld	62½	50
1 to 3-inch, buttweld.....	64½	52
2-inch, lapweld	56½	44
2½ to 6-inch, lapweld.....	60½	48
7 to 12-inch.....	57½	44
Reamed and Drifted		
1 to 3-inch, buttweld.....	62½	50
2-inch, lapweld	54½	42
2½ to 6-inch, lapweld.....	58½	46
Extra Strong, Plain Ends		
⅛-inch, buttweld	46½	29
¼ and ⅜-inch, buttweld.....	49½	32
½-inch, buttweld	55½	44
¾-inch, buttweld	60½	49
1 to 1½-inch, buttweld.....	62½	51
2 to 3-inch, buttweld.....	63½	52
2-inch, lapweld	54½	43
2½ to 4-inch, lapweld.....	58½	47
4½ to 6-inch, lapweld.....	57½	46
7 to 8-inch, lapweld.....	53½	40
9 to 12-inch, lapweld.....	48½	35
Double Extra Strong, Plain Ends		
⅛-inch, buttweld	44½	34
¼ to 1½-inch, buttweld.....	47½	37
2 to 2½-inch, buttweld.....	49½	39
2-inch, lapweld	42½	33
2½ to 4-inch, lapweld.....	44½	35
4½ to 6-inch, lapweld.....	43½	34
7 to 8-inch, lapweld.....	39½	26

The National company likewise has issued new cards on lap welded boiler tubes, line pipe, large O.D. wrought steel pipe, merchant casing for water wells, etc. Boiler tubes were reduced as follows: $4 on 1¾-inch; $12 on 2 to 3-inch, inclusive and $10 on 3¼-inch and larger. The following table compares the new less than carload discounts with those of April 13, four points to be added for the carload discount:

Sizes	Basing April 13	Basing July 7
1¾-inch	15½	17½
2 and 2¼-inch.....	26	32
2½ to 3-inch.....	37	43
3¼ to 13-inch.....	43	48

The line pipe discounts compared with those of April 13 follow:

Size	Basing April 13	Basing July 7
2½ and 3-inch, buttweld..	56½	63½
2½ to 6-inch, lapweld.....	52½	59½
7 to 12-inch, lapweld.....	49½	56½
13 and 14-inch, lapweld...	40	on application
15-inch, lapweld	37½	on application

Discounts on large O.D. wrought steel pipe compared with those on card issued April 13 follow:

Sizes	Jobbers' Car loads April 13	Jobbers' Car loads July 7	Consumers' Car loads April 13	Consumers' Car loads July 7
14 to 20-inch O. D.	51½	53½	46½	48½
21 and 22-inch O. D.	46½	48½	41½	43½
24-inch O. D.....	42½	44½	37½	39½
26 to 30-inch O. D.	37½	39½	32½	34½

Discounts on merchant casing for water wells, etc., are two points greater on sizes 2 to 6⅝-inch inclusive and three points greater on 7¼ to 12½-inch.

The National Tube Co. put out card No. 4 on oil country goods, dated July 7, registering declines of $2 to $7 per ton. Independents are doing likewise. This list gives the confidential net prices delivered in carload lots, f.o.b. points in oil country districts throughout the United States, taking freight rates from 10 cents to $2 per hundred pounds.

Some Activity in the East

New York, July 12.—A lot of 300 tons of 6 to 30-inch cast iron pipe is being inquiried for by Ilion, N. Y. Bids are to be closed shortly. Attica, N. Y., is to close on a similar tonnage today. Little else in the way of municipal tonnage is pending. Private demand is being maintained in fair volume. Prices are showing an easier tendency, the market now appearing at $48.30 to $50.30, New York, on 6-inch pipe and over and at $53.30 to $55.30.

Activity Improves in West

Chicago, July 12.—Small municipalities throughout the West are rapidly taking advantage of the low prices now ruling in the cast iron pipe market, and orders the average during the past week have shown a decided improvement over the average for June and the first week in July. Inquiry out at present shows a better volume than at any time in several months. Duluth is asking for bids on 600 tons, closing July 14. Evansville, Ind. and Detroit opened bids yesterday for 100 tons each. Other cities which are to open bids during the present week are Faribault, Minn., 100 tons, Forest Lake, Minn., 200 tons, and Harrodsburg, Ky., 200 tons of 4-inch pipe. Bids on the Fort Wayne, Ind., project were rejected, but are up again for refiguring, with 475 tons involved. Akron, O., will open bids July 15 covering 7000 tons of pipe, a large part of which is 48-inch. During the past week Minneapolis awarded contracts totaling 200 tons, 140 tons of which went to the National Cast Iron Pipe Co. The balance it is understood was divided between the United States Cast Iron Pipe & Foundry Co. and the American Cast- Iron Pipe Co., Armstrong, Iowa, awarded 200 tons to the National Cast Iron Pipe Co. Demand in certain sizes of pipe has exceeded capacity of some of the makers, with the result firmer prices have prevailed in one or two recent sales. In one sale a price of $39 on 12-inch lengths took the contract. Prices are so dependent upon sizes and other conditions that the market is difficult to quote. A spread of $47.10 to $54.10 on 6-inch and over at Chicago is necessary to cover current awards.

Disappointment in Pipe Trade

Birmingham, Ala., July 11.—Expected impetus to the cast iron pipe trade did not set in and production has been curtailed, two of the larger plants in this district being practically down. The tonnage received here lately is light. Quotations are uncertain. While $42 for the larger size, high pressure pipe is to be heard reports are that a lower figure can be obtained on any tonnage of consequence. The melt of iron in the cast iron pipe trade has decreased in the last two weeks.

Reductions Are Expected

Youngstown, O., July 12.—Pipemakers here are bringing out new cards of discounts in line with those issued by the National Tube Co. Demand for pipe in this district continues light as is reflected by operating schedules this week. The Youngstown Sheet & Tube Co. has two pipe furnaces working and the Republic Iron & Steel Co. three, or a total of 5 of 17 mills.

English Ferro

Offered by Second Hands at $68—Spiegel Steel Not Being Produced

New York, July 12.—Second hands are willing to sell standard English ferromanganese at $68, c.i.f. tidewater, and this price probably could be shaded on a firm bid. Direct American agents of the English producers, so far, have not offered at less than $70, tidewater. Some 76 to 80 per cent Swedish ferromanganese produced in electric furnaces recently has been offered at $68, tidewater, but no business resulted. Demand continues lacking, so that the market is untested. The domestic market may be quoted at $75 to $80, delivered.

While no spiegeleisen was produced in this country during June and none is being produced at present, large stocks are on hand both in consumers and at the furnaces, and these are sufficient to meet demands for some time. Present prices are netting a loss to producers so the latter probably would not show any great anxiety to resume production at the present market level. Demand is restricted to carload lots and the market may be quoted at $27 to $30, furnace, for 20 per cent metal.

New business in special ferroalloys continues almost at a standstill. A few inquiries for carloads of 50 per cent ferrosilicon have been in the market and prices down to $67, delivered, have been quoted. Some are asking $76 to $80. The market may be quoted $67 to $80, delivered. Ten to 15 per cent ferrosilicon is quoted $39 to $40, furnace. The tungsten market is somewhat firmer, several speculative inquiries for concentrates having been in the market, based on tariff prospects. Concentrates now are quoted $3 to $4, per short ton unit, nominally. Ferrotungsten still is quoted 50 cents a pound contained. Ferrovanadium prices have eased a little on the low silicon alloy, which now is quoted $5.50 a pound contained. Open-hearth alloy continues held at $5 base. No new business is reported in ferrochrome and only small shipments against specifications are going forward to the alloy steel makers, most of whom are operating at a low rate.

Sales Are Limited

Pittsburgh, July 12.—Only limited tonnages of all kinds of ferroalloys are being asked for and sales also partake of that character. Most inquiries are for 1 to 5 tons, although carload inquiries appear from time to time. The Duquesne Steel Foundry Co., this city, which received 250 tons of steel castings for the Philadelphia navy yard, is understood to be in the market for 50 per cent ferrosilicon. The Union Steel Castings Co., likewise manifests interest in both ferrosilicon of that grade and ferromanganese. Ferrosilicon, 50 per cent, is being quoted at around $65, delivered, the Mesta Machine Co. claiming to have an even lower price than that delivered Homestead, Pa. The latter company likewise is obtaining some low figures on ferrochrome, 12 cents per pound, maker's plant, having been quoted. A few single carloads of spiegeleisen continue to be moved occasionally at prices from $27 to $31, f.o.b. furnace.

Orders Still Decline

Unfilled orders of the United States Steel Corp. on June 30 amounted to 5,117,868 tons, a decline of 364,619 tons. The total bookings on that date were the smallest since June 30, 1919, when the orders amounted to 4,892,855 tons. The present decline reflects the falling off in business. Further comparisons follow:

Date	Total	Change, tonnage	Change, per cent
June 30, 1921...	5,117,868	364,619—	6.2 —
May 31, 1921...	5,482,487	362,737—	6.2 —
April 30, 1921...	5,845,224	439,541—	6.8 —
Mar. 31, 1921...	6,284,765	649,102—	10.32—
Feb. 28, 1921...	6,933,867	639,297—	8.21—
Jan. 31, 1921...	7,573,164	574,958—	7.59—
Dec. 31, 1920...	8,148,122	873,359—	9.68—
Nov. 30, 1920...	9,021,481	815,371—	8.26—
Oct. 31, 1920...	9,836,852	537,952—	5.16—
Sept. 30, 1920...	10,374,804	430,234—	3.56—
Aug. 31, 1920...	10,805,038	313,430—	5.4 —
July 31, 1920...	11,118,468	139,651+	.7 +
June 30, 1920...	10,978,817	38,751+	0.35+
May 31, 1920...	10,940,466	580,719+	5.6 +
April 30, 1920...	10,359,747	467,672+	4.51+
Mar. 31, 1920...	9,892,075	389,994+	3.94+
Feb. 29, 1920...	9,502,081	216,640+	2.3 +
Jan. 31, 1920...	9,285,441	1,020,075+	11.00+
Dec. 31, 1919...	8,265,366	1,137,036+	13.75+
Nov. 30, 1919...	7,128,330	655,662+	9.20+
Oct. 31, 1919...	6,472,688	188,030+	2.90+
Sept. 30, 1919...	6,284,638	175,535+	2.80+
Aug. 31, 1919...	6,109,103	530,442+	9.50+
July 31, 1919...	5,578,661	685,806+	14.00+
June 30, 1919...	4,892,855	610,545+	10.70+

The Nonferrous Metals

Slump in Exchange Halts Exports—Lead and Zinc Firm—Copper Products Cut Twice—All Metals Slow

	‡Copper	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel shot
July 6	12.75	29.00	4.50	4.35	22.50	4.75	40.00
July 7	12.75	28.75	4.55	4.35	22.25	4.75	40.00
July 8	12.75	28.625	4.55	4.35	22.25	4.75	40.00
July 11	12.75	28.00	4.55	4.35	22.25	4.75	40.00
July 12	12.75	28.37½	4.55	4.35	22.25	4.75	40.00

‡Electrolytic delivered.
†Open market quotation.

NEW YORK, July 12.—The sharp break in sterling exchange to $3.62¾ July 11 retarded the improvement which had been evident for a week previously in the metal markets. The previous week had witnessed a good volume of export sales of copper to the Continent, England and Japan, but the break in sterling checked this business. Domestic buying of all metals and metal products has remained extremely slow. However, the prospects for tariff protection which would end the demoralizing influence of importations of Spanish lead and German zinc have had an influence in the lead and zinc markets and sellers have been firm at higher prices.

It has been possible to buy electrolytic copper from producers all week at 12.75c, delivered, for prompt and July deliveries, and one sale at 12.60c, delivered Connecticut, was reported. Outside holders quoted 12.62½c, refinery. A car of casting copper sold at 12c, refinery, and some scattered lots of composition metal went to foundries, but foundry buying generally is still light. Lake copper was quoted nominally 12.87½c to 13c, delivered. Sales of electrolytic copper in June were about 50,000,000 pounds.

Little lead has been offered for sale lately and though consumers have been cautious prices have been strong. The leading interest has maintained its quotation of 4.40c, New York and St. Louis, but outside sellers have been asking 4.50c to 4.55c, New York and 4.35c to 4.45c, St. Louis.

While consumption of zinc is probably lower this month than at any time this year, due to the number of sheet mills closed, the market for zinc is up about 15 points from the low, being steady at 4.35c, East St. Louis. Some sales have been made at this level. High grade zinc has been steady at 6c to 6.25c, New York.

The tin market dipped July 11 to a level close to the lowest of the year, which in turn was the lowest since 1909. No business of importance has been done, but importers asked about 28.25c for Straits for all positions, while 27.75c was bid. This bid price was the low done early in the year. Ninety-nine per cent tin has been quoted about 1c below Straits. The electrolytic tin producer has not been quoting freely.

Antimony has been in light demand and spot metal has continued obtainable at 4.75c, duty paid.

Brass and copper products have been cut the past few days. The first cut was ¼c on rolled and drawn copper products and ½c on rolled and drawn brass. The second cut came today, being ¼c further on copper products. Buying remains light, but a fair number of light orders are coming in.

Mill Products

SHEETS	
Copper, hot rolled, 24 oz., minimum	20.75
High brass	15.75
Zinc, ga. 9 to 18 (plates ½c less)	10.00
Lead, full sheets (cut ¼c more)	8.25
SEAMLESS TUBES	
High brass	18.50
Copper	21.00
RODS	
High brass, round, ¾ to 2½ in.	13.75
Naval brass rod	16.75
WIRE	
Copper	14.60-15.25
High brass	16.75

Dealers' buying prices on old metals follow:

Old Metals

HEAVY RED BRASS		
Chicago		7.50
Cleveland	8.00	8.50
New York	8.75	9.25
HEAVY YELLOW BRASS		
New York	5.00	5.25
Chicago		5.50
Cleveland	4.50	5.00
ZINC		
New York	2.50	2.75
Cleveland	2.00	2.50
Chicago		2.25
HEAVY COPPER AND WIRE		
Cleveland	9.00	9.50
Chicago		8.50
New York	9.25	9.50
RED BRASS TURNINGS		
New York	6.75	7.25
Cleveland	6.00	6.50
Chicago		6.50
YELLOW BRASS TUBING		
Cleveland	4.50	5.00
NO. 1 BRASS ROD TURNINGS		
Cleveland	4.00	4.50
New York	4.50	4.75
Chicago		4.50
ALUMINUM BORINGS		
Cleveland	5.00	5.50
Detroit	6.00	7.00

Competitive Prices

Met by Steel Corporation Says Gary—Overtime Is Eliminated

The United States Steel Corp., on July 6, reduced its prices to the level which on July 4 had been announced by the Bethlehem Steel Co. Chairman E. H. Gary, in announcing the new prices, also stated that the 8-hour basic day system providing for time-and-a-half payment for overtime would be abandoned on July 16. Judge Gary's announcement follows:

"We have decided to recommend to our subsidiary companies that they reduce selling prices to correspond with the existing prices of competitors. These include products and prices as follows:

Bars	$ 1.90
Structural shapes	2.00
Plates	2.00
Sheet bars	35.00
Billets, 4 x 4	33.00
Slabs	34.00
Blue annealed sheets	2.65
Black sheets	3.50
Galvanized sheets	4.50
Tin plate	5.75
Skelp	2.00

"Also pipe and possibly some other products relatively.

"Also to abrogate, as of July 16, 1921, the so-called 'basic' or 'overtime' day put into effect during the war as an emergency measure."

In a subsequent statement by Judge Gary, July 8, reductions of $2 to $12 per ton on standard steel pipe and boiler tubes and $5 on wire nails and wire products were announced. Judge Gary's announcement read:

"Referring to our statement of July 6 concerning selling prices, and in accordance therewith, we have decided to recommend to subsidiary companies that the present prices of tubes be reduced as follows:

Standard steel pipe ¼-inch and ⅜-inch	$ 2.00 per ton
½-inch to 6-inch inclusive	6.00 per ton
7-inch to 12-inch inclusive	6.00 per ton
Sizes above 12-inch	4.00 per ton
Boiler tubes 1¼-inch	4.00 per ton
2-inch to 3-inch inclusive	12.00 per ton
3½-inch and larger	10.00 per ton

"And that wire nails be reduced to $2.75 per keg base, plain wire to $2.50 per 100 pounds base and other wire products relatively."

The new wire and nail prices represent a reduction of $5 per ton. The new prices became effective immediately.

Basic Bought at $19.50; Sheet Bars at $35

Pittsburgh, July 12. (by wire)—A Mahoning valley steel maker has purchased 2000 tons of basic pig iron for early delivery at a reported price of $19.50 valley. The sale is reported to have been made by a nearby steel maker.

The N. & G. Taylor Co., Cumberland, Md., has purchased 1500 tons of sheet bars at $35 mill. The business is reported to have gone to a western Pennsylvania steel plant which has some freight advantages to Cumberland.

Price Adjustments Made at San Francisco

San Francisco, July 9.—Interest in the iron and steel market is centered on the price reductions announced by the Bethlehem Steel Co. and the United States Steel Corp. Many of the independent companies have adopted the Bethlehem company's schedule, although a number of independent mills have not advised their representatives regarding lower prices.

Sales of pig iron, so far as can be learned, did not exceed 2000 to 3000 tons during the past week. There is almost a complete absence of inquiries.

Sales of merchant bars continue negligible, with consumers manifesting no desire to buy, even at 1.90c. The only sale involving a fair tonnage reported was one lot of 170 tons of various sized rounds for the Southern Pacific Co. This went to the Columbia Steel Co. at 2.35c, base, Pittsburgh, Cal.

Shipyards continue to lay off men and report no new contracts in sight. The 2.00c, base Pittsburgh, price appears to be the lowest level at which plate business has been taken, although one consumer claims to have bought at 1.95c.

There is reported to have been a little improvement in structural steel demand, but the majority of recent awards are for 30 to 60 tons. The contract for the Oregon City bridge, involving 500 tons, has not as yet been awarded. A. Guthrie & Co., Portland, were low bidders. The Pacific Gas & Electric Co. is calling for bids on another transmission tower line, bids to be opened on July 18. The contract will require approximately 1800 tons of steel.

Melting steel was sold this week to mills in the southern part of the state at $9 a gross ton, delivered. Cast iron scrap sales have been confined to one or two carloads, prices ranging from $20 to $22, delivered, although distress lots have been picked up.

Demand from private sources for cast iron pipe, keeps up well. The National Cast Iron Pipe Co. was awarded 65 tons of 4-inch class B pipe by the city of Redwood, Cal. Bids will be opened July 11 by Yuba City for the laying of water mains, calling for 7500 feet of 8, 6, 4 and 3-inch pipe.

Pacific Coast

Awaits Price and Freight Adjustments—All Lines Are Dull

Seattle, July 9.—Dealers in iron and steel report trade dull and business quiet. The situation appears to hinge largely on prospective price and freight readjustments.

The cut announced by the Steel corporation was reflected today in a reduction of warehouse prices ranging from 10 cents per 100 pounds on steel bars, shapes and bands to 30 cents on black and galvanized sheets. Notwithstanding these reduced prices buying is not expected in volume.

Exporters state inquiries from the Orient are fairly numerous although some say export business is absolutely stagnant. Only small tonnages have been booked for Japan and China. One firm, however, has booked several lots of sheets. Japan is buying black sheets in preference to others. There is no call for galvanized since an increased tariff of 15 per cent has been placed. The Japanese buyer consequently is ordering black sheets and the galvanizing business is being done in Japan.

Some inquiry for small pipe, in dimensions running from ⅜-inch to two inches has appeared and while exporters are working on this business it is not known that any large tonnages have been placed. It is said prices are weaker for the smaller sizes and stronger for 2-inch. Japanese buyers are also said to be inquiring for steel rails. One local firm has quoted 60-pound rails at $60 c.i.f. and is hoping to close the business soon.

Wholesale warehouse prices under the changes effective today are as follows:

Steel bars, 4.15c; shapes, 4.15c; plates, 4.25c; blue annealed sheets, 5.60c; black sheets, 6.45c; galvanized sheets, 7.45c; bands, 4.85c; cold rolled shafting, 5.75c.

Valley Steel Mills Begin New Wage Cut

Youngstown, July 12.—The first step toward another wage reduction in the Mahoning valley, as referred to elsewhere in this issue of THE IRON TRADE REVIEW, actually has been taken by the Sharon Steel Hoop Co. The company announced on July 12 last that effective July 16 it will reduce the common labor rate to 30 cents an hour. This compares with 27 cents an hour which the Bethlehem Steel Co. will pay, and 37 cents which the United States Steel Corp. will pay with overtime eliminated. The Sharon company also will discontinue time and a half payments.

Manganese Tariff To Be Attacked

Eastern Congressman To Oppose Western Delegations on This Paragraph—Dyestuffs Provisions Also Under Fire—Debate On Bill Begins This Week and Vote Is Fixed for July 21

WASHINGTON, July 12.—Beginning Thursday, amendments to the Fordney permanent tariff bill will be considered by the house, and it is understood that members of the New York and Pennsylvania delegations will attempt to cut down the proposed high rates on ferromanganese and manganese ore. Although Chairman Tilson of the metals subcommittee or the ways and means committee, which drafted the bill, fought the rates finally inserted in the bill, he has declared his intention of not contesting further. Western and southern representatives who put through the rates declare they will hold their ground despite the backfire of the eastern importers and certain steel producing interests. The present outlook is that the chief opposition to the metals schedule will center around alloys and their ores.

Until Thursday debate on the Fordney bill will be general. After Thursday, discussions to the bill will be limited to five minutes and amendments will be considered on the floor of the house. The final vote on the bill is now fixed for July 21, when the bill will be voted upon as a whole and not by schedules. Minor changes will be proposed by Mr. Tilson, mainly to clarify certain provisions. One amendment by Mr. Tilson will take all references to copper and brass wire out of paragraph 378 and let them be covered by paragraph 393, which would impose a duty of 35 per cent ad valorem. It is possible that an effort will be made to increase the duty on saws.

Claim is made both by Chairman Fordney of the ways and means committee and Chairman Tilson of the metals subcommittee that the metal schedule has been accorded a "wonderful reception". Not a serious complaint has been received by Mr. Tilson, so he asserts, while those received by the ways and means committee proper have been confined largely to the ferromanganese and manganese ore rates. Comparisons of the Fordney bill with the Payne-Aldrich act of 1909 are unfair, Mr. Tilson avers, because of changing conditions, and whether the Fordney bill is higher or lower than the Payne-Aldrich act is not pertinent. Reports on the bill have been made by both majority and minority members of the committee, but they are largely perfunctory. An attack on the dyestuffs provisions by Representative Frear includes a blast at rail producers. The increase in the rail price from $28 to $47 is "indefensible", he declares, and "any measure that protects this overgrown infant with high tariff rates will only serve to help fleece the public". The minority report makes no specific mention of the metals schedule, while the majority report includes a summary of Chairman Tilson's recommendations.

Interest in the tariff bill has not been lessened any by the certainty that on reaching the senate it will be sidetracked indefinitely. In the past week President Harding has taken his long-deferred rap at the dilatory conduct of congress, and has personally urged concentration on revenue legislation. The program as it stands today is for the house to pass the tariff bill on July 21, and then for the ways and means committee immediately to begin tax hearings. Meanwhile, the senate would recess until late August, at least, so not to consider legislation that would impede the progress of the tariff and tax bills. Originally, Senator Penrose's finance committee was to hold hearings only on tax bills and Chairman Fordney's ways and means committee only on the tariff. But now that Senator Penrose has declared his intention of picking over the tariff bill, this agreement appears void.

Speaking on the floor of the house yesterday Chairman Tilson defended the metals schedule, declaring that the rates contained therein "are necessary if these industries are to be preserved in this country". Chairman Tilson referred to the unemployment situation and said that "the only way to bring back prosperity is to impose customs duties which will put American manufacturers on equal terms with their foreign competitors." The important question to be decided, he insisted, "is whether the wages of our workmen and our standard of living are to be brought down to those of foreign countries and whether our industries are to continue in this country to furnish employment for capital and labor or whether they are to be transferred to foreign soil." Chairman Tilson's address was substantially that of the report of his metals sub-committee back to the ways and means committee, which was condensed in the majority report of the ways and means committee to the house.

Coal Tar Product Schedule Under Fire

WASHINGTON, July 12.—Coal tar products, included in the chemical, oil and paint schedule of the Fordney tariff bill, are proving the storm center of the bill and are under the fire not only of the Democratic minority but also certain of the Republican majority. The dyestuffs provisions have been handled without gloves in the Frear report, and are being defended in the house by Representative Longworth.

Some 2500 words are devoted to the dye proposal. Dyes are to be divided into two classes by the federal tariff commission. Class A is to include such dyes as are obtainable in the United States on "reasonable terms" of quality, price and delivery, and Class B to include all other dyes. No dyes of Class A can be imported under any terms or conditions.

The tariff commission has sole power to determine what constitutes "reasonable quality, price and delivery." No dyes in Class B in excess of a 6-month supply can be imported without a license from the commission. The commission is to prevent the delivery of any dyes falling within Class A. These provisions, it is contended, give domestic dye producers a monopoly on all dyes which the commission declares can be obtained "reasonably" in this country.

In the Fordney tariff bill certain coal tar products are set down for a duty of 30 per cent ad valorem and 7 cents a pound and others at 35 per cent and 7 cents a pound. Included in the former are these classifications: "All distillates of coal tar,

blast furnace tar, oil gas tar, and water gas tar which on being subjected to distillation yield in the portion distilling below 190 degrees Cent. a quantity of tar acids equal to or more than 5 per cent of the original distillate."

The "free list" includes: "Coal tar products—pitch of coal tar, pitch of blast furnace tar, pitch of water gas tar, crude coal tar, crude blast furnace tar, crude oil gas tar, crude water gas tar * * *."

Particular protest is lodged against the registry provisions of the bill. After registering and receiving their license, dyestuffs importers must put up $10,000 bond, which will be confiscated if any violation is charged. Licenses may be revoked for a period of three years. The final determination what dyes may be imported and what dyes must be purchased from American makers—mainly the Chemical Foundation—rests with the tariff commission.

It is stated that coal tar dyes affect the livelihood of more than 1,000,000 persons employed in 11,000 manufacturing establishments. These plants are capitalized at $2,500,000,000, which is about the value of their annual output.

Coal Tar Industry Thrived in 1920

THAT the dye and coal tar chemical industry of the United States made notable progress in 1920 is shown in the report on the census of dyes and coal tar chemicals just issued by the United States tariff commission. According to the report, the American manufacturer has reached the stage where he is adding to his list of products those dyes which, although not consumed in large quantities, are yet of importance in the establishment of a well-rounded and self-contained coal tar chemical industry in the United States.

The output of dyes in 1920 exceeded 88,000,000 pounds valued at more than $95,000,000 which was a 40 per cent increase in both quantity and value over the preceding year, and was 92 per cent in excess of the prewar imports. On the other hand, the imports of coal tar dyes amounted to only 3,400,000 pounds valued at $5,760,000. About one-half the imports was from Germany and about one-third from Switzerland, the remainder coming from England and other countries. Vat dyes, other than indigo, represented the largest class imported.

A detailed study of production, imports and exports, shows that the value of the domestic output in 1920 was at least 120 per cent of the domestic consumption, assuming consumption is production plus imports minus exports.

Increase in Vat Dyes

The most significant development in 1920 was the large increase in output of vat dyes, which in previous years had been lacking. The output of indigo, the most important vat dye, was more than double the production of 1919, and also twice as great as the prewar imports. This dye now ranks first in quantity produced, instead of sulphur black, which takes second place among domestic dyes. The production of vat dyes, other than indigo, showed a gain of nearly 200 per cent over the previous year. Vat dyes, owing chiefly to shortage of anthracene in the early stages of the domestic industry, German control of patents until October, 1917, small consumption, and complexity of manufacture were among the latest to be developed by the American producer. While there is still a certain lack of variety and quantity in this class, the progress during 1920 has shown that the American industry possesses the ability to produce vat colors on a large scale.

A year ago the question of obtaining an adequate supply of anthracene for the manufacture of vat dyes was one of the most vital problems facing the dye industry. During 1920, however, the commercial production of synthetic anthraquinone in substantial amounts and the increased output of crude anthracene gave promise of solving this very important problem. It now appears that as fast as the needs of the dye makers increase for these fundamental raw materials the domestic output will meet the demand.

The total number of firms engaged in the production of coal tar products in 1920 was 213, while those companies engaged in the manufacture of dyes alone numbered 82. Three hundred and sixty separate dyes were manufactured in 1920. Of these, 108 dyes, the output of which represented more than 90 per cent of the total production, were each manufactured by three or more firms.

The total exports in 1920 of "aniline dyes" and "all other dyes and dyestuffs" were approximately $35,000,000 or about double the value of the 1919 shipments. During the first four months of 1921, however, the exports showed a rapid decline and during the month of April were only about 10 per cent of the maximum monthly export of 1920. This may be attributed to the reappearance of German dyes either directly or through re-exportation of reparation dyes in the large export markets of the world, such as China, Japan and India.

From a national standpoint, one of the most important developments in the coal tar industry during 1920 was the production for the first time of triphenylphosphate in large quantities and of tricresylphosphate in lesser amounts. These two coal tar products have been utilized as substitutes for camphor in the manufacture of pyroxlin plastics.

Names Tower Chief of Steel Division

Washington, July 12.—Walter S. Tower, of the Consolidated Steel Corp., New York, definitely has been announced by Secretary Hoover as chief of the iron and steel division of the bureau of foreign and domestic commerce as indicated in the IRON TRADE REVIEW last week Secretary Hoover is now turning to the chemical division. It is expected that Grinnel Jones, now professor at Harvard university and in the war period with the federal tariff commission, will be given charge of this division. In announcing Mr. Tower's appointment the commerce bureau made this statement:

"Before taking up his duties as chief of the iron and steel division Mr. Tower in co-operation with the shipping board will study the commercial aspects of the American shipping problem, including trade routes, allocation of shipping, assignment of tonnage and the like. This is an important investigation and Mr. Tower is considered particularly well equipped to undertake the work.

"When his work with the shipping board is completed Mr. Tower will assume charge of the iron and steel division. He will investigate the iron and steel industry in Europe. The iron and steel industry is looked upon as the key industry to reconstruction and while Mr. Tower will pay attention to the purely export side he intends to devote the greater portion of his time to the fundamental problems involved in the resumption of trade, using the iron and steel industry as the basis of his studies.

"Mr. Tower is a recognized authority on shipping matters. During the war he was director of the division of planning and statistics of the shipping board."

British Works' Recovery Is Slow

Activity Confined Largely to Finishing Mills as High Price of Coal Retards Recuperation—June's Production of Pig Iron 500 Tons; and Steel 1500—Foundries Import Belgian Iron at $26.68—French and Belgian Prices Cut

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-4 Caxton House, Westminster, S. W.

Sterling—$3.68

LONDON, July 11.—Activity in the British iron and steel industry following the coal strike is practically confined to the finishing mills. Blast furnaces are slow in getting started again, and readjustments in the iron and steel trades generally are delayed temporarily owing to the high price of coal. It is expected that the price will drop in the near future when production is resumed on a large scale, but at present it is £2 ($7.36) per ton. Spot furnace coke has been bid up to £3 5s ($11.96).

Production of pig iron in Great Britain in June totaled 500 tons as compared with 13,600 tons in May, 60,000 in April, 385,000 in March, 463,600 in February and 637,700 in January.

Output of steel ingots and castings in June amounted to 1500 tons compared with 5600 tons in May; 70,000 in April, 362,000 in March, 483,500 in February and 493,400 in January. Production is still on the down grade.

Exports of iron and steel in June totaled 65,000 tons, compared with 99,000 tons in May, 161,000 tons in April and 290,039 tons in March. June imports totaled 84,000 tons, against 82,000 tons in May, 111,000 tons in April and 36,000 tons in March.

The scarcity of British foundry pig iron is being relieved by the importation of Belgian iron at £7 5s ($26.68), delivered. The price of the British iron is firmer.

The export hematite market is weak, £7 ($25.76) being accepted by British makers. The sheet and tin plate market is the most active of the markets, and mills are resuming operations. Galvanized sheets have been advanced £1 ($3.68). The makers have good inquiries from the Far East.

French semifinished material has been cut to 300 francs ($24.90) per metric ton and shapes to 430 francs ($35.69). Belgian wire has been reduced to 500 francs ($41.50). German prices are firmer; bars now being quoted at 1600 marks ($24); plates 1700 marks ($25.50); wire, 1700 marks ($25.50), and billets, 1200 marks ($18).

Guest, Keen & Nettlefold, Ltd., South Wales, have been awarded 13,500 tons of rails for India at £10 2s 6d ($37.26) per ton. Belgian mills are understood to have quoted £11 18s 3d ($43.84), while the Germans bid £9 14s 3d ($35.74) but their tender was unacceptable. It is understood that an American interest offered the rails at $45.

French Pig Iron and Semifinished Cut

European Staff Correspondence

Franc—0.081

PARIS, July 1.—Notable reductions have been made in prices of pig iron, and they are being reflected in lower quotations on merchant bars, plates and sheets. The reductions on the latter average from 10 to 50 francs ($0.81 to $4.05) per ton.

Hematite pig iron has been cut 25 francs ($2.02) under the "comptoir" quotation of 450 francs ($36.45). The same French hematite is selling in Belgium at from 25 to 50 francs ($2.02 to $4.05) under the domestic price. This is a result of low quotations of English hematite. Pig iron stocks continue to be of large proportions regardless of the new incentive for consumers to buy.

French exports for the first three months of 1921 included 1,277,200 tons of iron ore, as compared with 832,000 tons in the same period in 1920; pig iron, 184,000 tons compared with 94,000 tons; and rails, 31,500 tons compared with 8500 tons. Exports of plates and sheets in the three-month period increased by 14,700 tons over those in the same period in 1920. French rail makers consider export business as satisfactory in view of the 9000-ton Argentine contract taken at 528 francs ($42.76) c.i.f. and 3000 tons secured from Chile by the de Wendel mill at Hayange, against 47 international bidders. Another order for 4800 tons of rails of French manufacture has been booked in Finland in competition, it is said, with offers from Great Britain, Belgian and German manufacturers.

The Comptoir Siderurgique de France decided on June 23 to allow its members to seek individual orders in the open market rather than await the distribution by the comptoir of such orders as may be placed collectively through the organization. This means entire freedom of trading in semifinished materials and competition may be expected to bring prices downward within the next fortnight. The slight reductions already noted may be taken as an indication of what is to occur.

Belgian Feeling Lorraine Competition

European Staff Correspondence

Franc—$0.081

BRUSSELS, July 1.—French Lorraine competition in pig iron is for the first time making itself felt in the Belgian field. French hematite is being sold in Belgium at 50 francs ($4.05) under the comptoir figures commonly quoted in France and 25 francs ($2.02) under the competitive French price.

Complaint is still made by Belgian iron masters against Luxemburg pig iron competition caused by abolishing

Current Iron and Steel Prices of Europe

British Market

Corrected to Date by Cable

Home Market Prices. Gross Tons at Works or Furnace

SEMIFINISHED STEEL

	$	£ s d
Billets, soft steel	36.80	10 0 0
Sheet bars	36.80	10 0 0
Wire rods	57.04	15 10 0

FINISHED STEEL

Steel bars, England, ½ to 3-inch	47.38	12 17 6
Ship plates, England	55.20	15 0 0
Ship plates, Scotland	55.20	15 0 0
Beams, England	53.36	14 10 0
Beams, Scotland	53.36	14 10 0
Sheets, black, 24 gage	66.24	18 0 0
Sheets, galvanized, 24 gage	84.64	23 0 0
Rails, 60-lbs. and over	55.20	15 0 0
Tin plate, base box, 108 lbs	2.76	1 5 0
Steel hoops	55.20	15 0 0

PIG IRON*

Hematite, West Coast Mixed Numbers	29.44	8 0 0
Hematite, East Coast Mixed Numbers	29.44	8 0 0
Middlesborough Basic	22.08	6 0 0
Middlesborough, No. 3	25.76	7 0 0
No. 3 Foundry, Derby, Leicester, Nottingham	33.12	9 0 0
No. 3 Foundry, Northamptonshire	†	† . .
No. 3 Foundry, Staffordshire	31.28	8 10 0
No. 3 Scotch Foundry	33.12	9 0 0
Ferromanganese 76 to 80 per cent	66.24	18 0 0

COKE

Yorkshire furnace	14.04	3 0 0
Yorkshire foundry	15.64	4 10 0

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. Export prices generally are subject to free negotiations.
†Stocks sold out.

French Market

Prices Last Reported.

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	34.44	425
Basic-bessemer, Lorraine	20.25	250
Foundry, Longwy, No. 3, sand-cast	17.82 to 19.04	220 to 235
Foundry, Longwy, No. 3, chill-cast	20.25	250
Foundry, Longwy, No. 2, sand-cast	20.25	250
Foundry, Longwy, No. 2, chill-cast	21.87	270
Ferromanganese, 76 to 80 per cent	76.95	950

COKE

French furnace	8.91	110
German, Belgian and British furnace	8.91	110
French foundry	11.75	145

SEMIFINISHED STEEL

Blooms	34.02	420
Billets	34.02	420
Sheet bars	34.02	420

FINISHED MATERIAL

Standard rails	36.45	450
Merchant bars	32.40 to 36.45	400 to 450
Angles	38.48	475
Normal beams and profiles	38.48	475
Plates, ship and tank, 10 millimeters and thicker	50.63	625
Plates, bridge and tank, 5 to 10 millimeters	56.70	700
Sheets, black, 3 millimeters	59.94	740
Sheets, blue annealed, 2 millimeters	76.14	940
Shafting, cold-drawn, 40 to 60 millimeters	60.75	750
Bars, 2 per cent nickel steel	113.40	1400

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported.

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic-bessemer, Belgian	16.20 to 17.82	200 to 220
Basic open-hearth, Belgian	15.80	195
Gray forge, Belgian	17.42	215
Foundry, No. 3, Belgian	18.23	225
Foundry, No. 3, Luxemburg	17.42	215
Foundry, No. 3, Lorraine	15.39	

SEMIFINISHED STEEL

Blooms	24.71	305
Billets	25.92	320
Sheet bars	27.95	345
Wire rods	37.67	465

FINISHED MATERIAL

Standard rails	40.50	500
Merchant bars	32.40	400
Normal beams and profiles	32.40 to 34.02	400 to 420
Plates, 5 millimeters and thicker	40.50	500
Sheets, black, 3 millimeters	42.53	525
Sheets, galvanized, 1 millimeter	113.40	1400
Plain wire	52.65	650
Galvanized wire	68.85	850
Wire nails	38.48	475

All prices are f.o.b. furnace or works.

customs dues on transactions between the two countries. The duty in this case is but 4 francs ($0.32) per ton of pig iron, and as shown by current quotations, the situation is being met by Belgian producers.

Belgium is meeting stiff German competition in Switzerland. German bars have been sold in Switzerland for 160 Swiss francs, which at the Belgian rate of exchange is approximately 350 francs ($28.35), while the best export price commonly quoted in Belgium is 400 francs ($32). Variable foreign exchanges account for much of the lack of stability in international trade in Europe. German plates are being offered in competition with those of Belgian manufacture at 188 Swiss francs, approximately 400 Belgian francs ($32), as compared with the Belgian quotation of 500 francs ($40.50).

Belgians have received orders for cars for Lower Congo railway and large and small interests are cheerful over the outlook.

Nearly half of the Belgian blast furnaces are damped down, but stocks of pig iron on hand are ample for many weeks. The government reports this week that 21 blast furnaces are alight out of 54, and that pig iron production in May was 75,790 tons, as compared with a monthly average of 94,043 tons in 1920.

German Syndicates' Prices Weakening

European Special Correspondence

DUSSELDORF, Germany, June 23.—Continued slow business conditions coupled with the abolition of government control of prices is weakening the position of practically all the great German selling syndicates or cartels, which are finding increasing difficulty in keeping their members in line as regards quotations. Even the pig iron syndicate, which has been an almost immovable rock in the sea of price fluctuations for many years, is being forced to reconsider the actual market situation on account of the heavy accumulation of pig iron stocks at the furnaces. The altered position and its influence on the selling syndicates is one of the chief features of interest in the German market at present.

Mark—$0.014

The pig iron syndicate expects to hold a meeting shortly to discuss the price situation. The general impression is that considerable reductions will be announced, perhaps to the extent of 300 marks ($4.20) per metric ton, which would result in an average price

in the neighborhood of 1200 marks ($16.80) per metric ton, f.o.b. Oberhausen and Siegen. Even such a price for pig iron is claimed to be too high in proportion to the best figure which manufacturers are now able to obtain for finished steel, but a reduction by the Pig Iron syndicate will at least mean a step toward the reestablishment of proper ratios in the price structure.

Pig iron prices, however, are not being liquidated as fast as those of other products. Pig iron is still about 1500 marks ($21.20) per metric ton. Ship plates, 5 millimeters and over in thickness, are quoted nominally at 1800 marks ($25.40), but it is not difficult for determined buyers to shade these prices to 1750 ($24.75) or even 1700 marks ($24.00), f.o.b. Essen. Rolled wire, that is wire rods over 5 millimeters, are being offered at 1540 marks ($21.75) while bars are being sold for 1600 marks ($22.60) or even less for attractive specifications. On good specifications for mine rails 1600 to 1650 marks ($22.60 to $23.30) per metric ton can be obtained, f.o.b. Oberhausen. However, all of these prices are below the cost of production and the mills therefore are not seeking business actively on these levels.

The prices of foreign ores delivered to Germany continue to show a declining tendency. Furnaces are refraining from buying, the feeling being that prices may become lower after the conclusion of the English coal strike when ships can reduce their freights by again taking coal out to Spain and the Mediterranean, bringing back tonnages of ore.

Recently some small lots of the best Santander have been sold as low as 25 shillings ($4.67 per ton c.i.f. Rotterdam, on a basis of 50 per cent iron natural and 8 per cent silica. Manganiferous ores with 40 per cent iron, 6 per cent manganese, and 9 per cent silica are being offered at 26 shillings ($4.86) per ton c.i.f. Rotterdam. French minette ore was sold last week at 8.50 francs per 100 kilos ($7.10 per metric ton) f.o.b. mines, on a basis of 33 per cent iron natural. The fuel situation remains easy on account of reduced industrial consumption. The shipbuilding steel syndicate is to be dissolved on July 1.

Canadian Mills May Meet Lower Prices

TORONTO, Ont., July 12.—Demand for pig iron in the Canadian market continues to fall off. With the exception of two or three furnaces, making basic iron, production in Ontario is at a standstill, no foundry iron having been made for some weeks. Furnaces, however, are well supplied with various classes of iron. Foundries and steel plants in Canada are gradually cutting down their operations and with the exception of the Dominion Steel Corp., Sydney, N. S., and the Algoma Steel Corp., Sault Ste. Marie, Ont., manufacturers of iron and steel products are short of orders. Prices continue unchanged and are as follows: No. 1, (2.25 to 2.75 silicon) $34.15, malleable, $34.15; No. 2, (1.75 to 2.25 silicon) $33.15, Toronto. Montreal prices are: No. 1 and malleable, $36.80; No. 2 $35.80.

Business in the finished iron and steel market has slumped during the past two weeks except for a few awards for small tonnages of structural steel. Prices for structural shapes and beams continue at 3.25c, Toronto. Mill representatives announce very light sales of bars at prices around 3.15c, Toronto. Some small orders have been placed for plates for bridges and boilers. Plates are quoted at 3.00c to 3.05c, Toronto.

Both black and galvanized sheets have again lapsed into comparative inactivity insofar as the mills are concerned and only small tonnages are being placed. Black sheets are still quoted at 5.40c, and galvanized, 6.65c, Toronto.

Despite the announcement that United States mills have reduced prices Canadian makers have not taken similar action, although it is expected competition from United States mills will be met by Canadians.

Trading in scrap continues quiet. Mills are not buying heavy melting steel or steel turnings except for immediate use, but dealers continue to buy limited quantities at $10 and $5 per ton, respectively. Steel axles are in little demand, dealers paying $20 per gross ton, Toronto. Wrought pipe and car wheels are not moving and while dealers are still offering $8 and $20, respectively, little is being purchased. Foundries have practically ceased to buy scrap. Dealers are offering $18 to $19 per net ton, Toronto, for No. 1 machinery cast, but there is no demand. Malleable scrap is being picked up around $12 per ton; stove plate at $14; grate bars, $11, and standard car wheels at $20, per net ton Toronto. Recent price reductions have not stimulated buying by consumers.

Forecast Iron and Steel Tonnage for Japan

Five year estimates of the iron and steel production and the tonnages of coal and iron ore to be required for Japan have been made recently by a financial and economic committee appointed by the Japanese government. The predictions follow:

	—Production— Tons		—Requirements— Tons	
Years	Pig iron	Steel	Coal	Iron ore
1920...	377,616	1,031,550	6,040,000	3,709,000
1921...	468,000	1,099,000	6,473,000	3,978,000
1922...	437,000	1,164,000	6,926,000	4,275,000
1923...	466,000	1,227,000	7,339,000	4,517,000
1924...	492,000	1,287,000	7,733,000	4,786,000

The committee at the same time recommended that a protective tariff be levied which ranges from 10 per cent ad valorem on iron ore to 15 per cent for steel. Materials for ship construction would remain free as at present.

Ruled Out as Carrier

Washington, July 12.—The Allegheny & South Side Railway Co., Pittsburgh, subsidiary of the Oliver Iron & Steel Co., is not a common carrier subject to the interstate commerce act, the interstate commerce commission has ruled. Along with this decision the commerce commission has stated that the contracts under which the Allegheny & South Side acts as switching agent for the Pittsburgh & Lake Erie and other defendant railroads are not shown to violate the act and the commission is without power to abrogate the contracts or revise their terms. It is also required that the Allegheny & South Side's schedules on file with the commission be canceled.

Delays Rate Study Action

Washington, July 12.—Up to today no action has been taken by the interstate commerce commission upon the request of the Southern Traffic league, Atlanta, that the commission institute a formal inquiry into railroad freight rates to determine whether business would be aided by lowering them. This is asked in place of the present piecemeal revision of rates now in process by the commission. If the commission adheres to its present attitude it will refuse such an inquiry.

Rail Equipment Chief Demand

China Again Enters the American Market for Large Number of Locomotives and Railroad Cars—Old Rail Inquiry Is Repeated—Many Export Inquiries Are Developing Into Substantial Orders

NEW YORK, July 12.—Although the export market is fairly brisk with inquiries none stands out as greatly important, excepting that for rolling stock for China. Business closed so far has been small and unimportant. It is believed by many of the export houses that the majority of the inquiries now in hand are merely feelers.

During the past week the Baldwin Locomotive Co. reported the receipt of orders for eight Mikado locomotives for the Mexican national railways, five Pacific locomotives for the Pekin-Hankow railways of China and a large order for locomotive forgings for India. The previous week the Mexican railways placed an order for 10 Pacific locomotives with this company.

The Orient looms largest in the export business for the moment. It is reported that the American Locomotive Co. has received orders for approximately 50 locomotives from China. These were ordered through the Japanese house of Mitsui & Co. They include Mogul, Pacific and other types. Deliveries are to be made during the current year. The South Manchuria railway is reported in the market for considerable rolling stock. The Universal Steel Export Co. is handling one order for 35 locomotives and 100 gondola cars and 100 box cars, from this road. The latter was to have opened bids on 40 passenger cars in addition, but the tenders on these have been postponed. All of these inquiries and orders are in addition to the large business which is now underway for the department of communications of the Chinese government, which is being transacted through the Universal Steel Export Co. It is also reported that the South Manchuria railway is inquiring for material for the construction of 15 railway cars and 100 40-ton cars. The Mukden-Pekin railway has repeated its old inquiry for rails.

Some of the independent houses report a fair inquiry from the Far East for miscellaneous light material, such as sheets and tin plate. One house has a Japanese order for 200 tons of light sheets and a Japanese inquiry for 800 tons of heavy rails.

Only slight recovery has been reported in South America. Ninety per cent of the internal combustion engines imported into the Argentine republic have been of American manufacture. A railroad and highway bridge over the Dulce river between Santiago del Estero and La Bauda is to be constructed at a cost of 2,500,000 pesos.

From Brazil the report comes that a steel mill will be installed in the state of Minas Geraes for the electric smelting of iron and the manufacture of steel sheets. A factory for the manufacture of cement and the reclamation of waste materials from metals, and the construction of a railway for the transportation of the raw materials for several industries are also contemplated.

W. R. Grace & Co. are said to have received a concession for the construction of a wharf at Valparaiso, Chile. The market for tractors in Chile is growing and, until recently, tractors in use there have been of American manufacture. Competition is developing from Canadian, German and British machinery makers.

The bids on 15,000 tons of rails for Argentina which were opened some time ago have not all been closed according to reports received here. The German bids were the lowest, but it is said 9500 tons of the rails went to Belgium at a price reported to be approximately $42 c.i.f., port of destination. This price was $10 a ton under the price quoted by the United States Steel Products Co., it is understood, and $7 a ton under the British quotations.

Ocean freight rates on iron and steel from Atlantic ports to points in the Far East have been reduced from $16 to $13 a ton.

Ocean Freight Rates

New York to	Pig iron billets, etc.	Steel bars, etc.	Plain wire in coils, etc.	Tin plate
Liverpool	$ 8.00	$ 8.00	$10.00	$10.00
London	8.00	8.00	10.00	10.00
Christiana	11.00	10.00	11.00	10.00
Copenhagen	11.00	10.00	11.00	10.00
Hamburg	9.00	9.00	13.00	9.00
Bremen	9.00	9.00	13.00	9.00
Rotterdam	8.00	8.00	12.00	10.00
Antwerp	8.00	8.00	10.00	9.00
Havre	8.00	8.00	10.00	9.00
Bordeaux	8.00	8.00	10.00	9.00
Barcelona	16.00	16.00	20.00	16.00
Lisbon	16.00	16.00	20.00	16.00
Marseilles	10.00	10.00	15.00	10.00
Genoa	9.00	9.00	12.00	10.00
Naples	9.00	9.00	12.00	10.00
Constantinople	15.00	15.00	15.00	15.00
Alexandria	15.00	15.00	15.00	15.00
Algiers	12.00	12.00	12.00	12.00
Dakar	20.00	20.00	23.00	23.00
Capetown	15.00	15.00	15.00	15.00
†Buenos Aires	12.00	12.00	12.00	12.00
†Rio de Janeiro	16.50	16.50	16.50	16.50
†Pernambuco	17.50	17.50	17.50	17.50
‡Havana	.44½	.44½	.44½	.44½
Vera Cruz	.60	.60	.60	.60
Calcutta	18.00	18.00	18.00	18.00
Valparaiso	16.00	16.00	16.00	16.00
§San Francisco	.75	.75	.75	.75
Sydney	15.00	15.00	15.00	18.00

†Landed.
‡Per 100 pounds, plus extra for wharfage.
§Per 100 pounds.

Budget Study May Slow Government Buying

Washington, July 12.—Purchasing by the various government departments may be slowed up for a sho t time pending the taking of invento y of surplus supplies and materials by order of Budget Director Dawes. The proposal of Director Dawes is to co-ordinate all purchases and sales of the executive departments by establishing a central bureau which would "clear" all buying and selling.

Plans of some of the departments and independent government agencies for effecting economies are vague and conflicting. The shipping board has decided not to sell any more material or supplies until an inventory of all the board's property has been taken. Even after this inventory is taken it is doubtful whether any surplus steel will be sold because of the depressed market. This means if the proposed sale of 110,000 tons of surplus steel at Hog Island is not called off the bids will be received but no award made.

The navy, on the other hand, seems to contemplate immediate action on some of its supplies and materials. Assistant Secretary Roosevelt has ordered the sale of three obsolete battleships, four cruisers and two gunboats as scrap. These ships are to be dismantled and only the hulls will remain. The navy has been preparing for some time for this sale, and has awaited orders from Secretary Denby or Roosevelt. The navy, however, is not making any special effort to move the 15,000 to 20,000 tons of surplus plates, shapes, bars, etc., which it has on hand because it believes present prices are too low. A decided slowing up in purchasing by the bureau of supplies and accounts of the navy department already is evident. June purchasing, on the other hand, was exceptionally heavy because appropriations expired June 30.

Prepare To Make New Wage Cuts

Independent Companies Ready To Bring Labor Rate Down to 30 Cents, Following Steel Corporation's Reduction to 37 and Bethlehem Steel Co's Cut to 27—Many To Go on Lower Basis July 16—Overtime Abolished—How Wages Are Being Deflated

FOLLOWING the action of the United States Steel Corp., in abrogating the so-called "basic" 8-hour day and thus abolishing the practice of paying 50 per cent extra for overtime work, independent iron and steel companies are preparing to announce further reductions in their wage scales. The Steel corporation's decision places the labor rate in the industry on substantially the same basis, which in the case of the common laborer now is generally 37 cents an hour. The order, or, as the United States Steel Corp. puts it, "recommendation to subsidiary companies," is effective July 16, but before that date a large number of independent companies will be employing labor at less than 37 cents. A majority of the independent companies eliminated the extra payment for overtime work several months ago. Many of these interests believe the time has now arrived for them to take the next step in process of deflation.

One large plant in the Middle West cut its common labor rate to 30 cents an hour July 1, while in the Cleveland district a similar reduction of 20 per cent probably will be made general by furnace and mill interests within three weeks. Some of these are not operating but are looking forward to a combination of lower labor costs and an accumulation of orders to enable them to resume in the near future. The managers of these companies expect a continuation of wage readjustments, in step with price deflation. Plant officials in the Youngstown district indicate that they will make another wage reduction in a few days, from 37 to 30 cents. The Eastern Steel Co. has just announced a cut to 28 cents at its plant, which compares with 27 cents the Bethlehem Steel Corp. will put in effect July 16. The Bethlehem company will continue for the present to pay time-and-a-half rates for Saturday afternoon and Sunday work.

Practically all independent companies in the Chicago district made a 20 per cent reduction in April, which in most cases brought the common labor rate to 37 cents. Since that time a number of the smaller companies have made further reductions, bringing the rates in some instances to 27 cents, and in others to 30 cents. All companies have abolished extra pay for overtime. The leading independent still has a 37 cent rate, but on July 1 abolished the 8-hour basis and extra pay for overtime. The total average reduction in wages made by the independents in the Chicago district since the first of the year amounts to approximately 33 per cent. A majority of the companies have made two cuts, one in April, and the other July 1.

In the eastern district the common labor rate paid in the steel mills on Jan. 1 was 40 cents an hour, and this was reduced during the month to 30 to 35 cents. Many of the mills have announced that lower rates will be put in effect July 16, ranging from 25 to 27 cents. Those mills which have not yet made the second reduction are expected to take action within a few days. Extra payment for overtime work has been eliminated by practically all of the mills.

In the Pittsburgh district leading independents have made no announcements regarding additional wage reductions, although considerable talk is heard about a cut of 7 cents per hour from the rate of 37 cents now paid. A number of companies, including the Pittsburgh Steel Co., abolished the overtime feature Jan. 1, the only reduction since being the 20 per cent cut from the 46-cent rate, inaugurated late in the first quarter. In the Pittsburgh district it is said manufacturers who now are on the same wage basis as the Steel corporation, will probably await further action by the leading interests before making any additional wage cuts. The West Penn Steel Co. eliminated the overtime feature last March and at that time reduced the hourly rate from 46 to 39 cents, making a further reduction to 37 cents on June 1.

In the St. Louis district the majority of independent companies since January have reduced wages 18 to 24 per cent, bringing the common labor rate to 20 to 25 cents per hour. All but two have abolished time and half payment for overtime work.

The Donner Steel Co., Buffalo, reduced wages 16½ per cent Feb. 1 and 10 per cent, July 1. These reductions applied to skilled and unskilled labor. The common labor rate in effect Jan. 1 was 39½ cents. It is now 30 cents. No extras for overtime have been in effect since Dec. 8, 1920. The Wickwire Steel Co. has not adopted a general policy in regard to skilled workers, their wages being adjusted individually. The common labor rate is 30 cents. Extras for overtime have been abolished.

One large steel company in Buffalo made a cut of 15 per cent just prior to January and followed this with another of 15 per cent, bringing the rate paid common labor to 33 cents. Overtime and extras were abolished about June 1.

The Steel corporation put in effect the basic 8-hour day Oct. 1, 1918, and under the arrangement, wages paid by this producer reached the highest point in its history. Beginning on Feb. 1, 1920, common labor was paid $5.06 for 10 hours of work and $6.44 for 12 hours, and this continued until May 16, this year, when a cut of 20 per cent was announced. This was the second reduction the Steel corporation ever found occasion to make in all its history.

The reduction effective July 16 is equivalent to 8.6 per cent in the wages of 10-hour workers and 14.29 per cent in the case of 12-hour workers. The common laborer working 10 hours will receive 35 cents a day less than he has been getting since May 16 and $1.36 less than he received when wages were at their peak. Still, his new wage will compare favorably with $2 a day he received in 1915 and will represent an advance of 85 per cent over that figure. The laborer who works 12 hours a day will receive $2 less than when wages were at their highest, but still will be $2.04 a day better off against the rate of 1915.

At the present rate of 37 cents an hour with time and a half for overtime, the wages for 12 hours work amounts to $5.18. With this hourly rate undisturbed, but the time-and-a-half pay for work in excess of eight hours eliminated after July 16, he will receive $4.44. The hourly rate in effect previous to the May 16 cut was 46 cents, this being the highest ever paid by the Steel corporation.

The new rate giving $3.70 for a straight 10-hour day represents a reduction of 27.87 per cent from the peak, while in the case of the 12-hour

worker, the new rate shows a reduction of 31 per cent. The majority of independent companies since the first of the year have put in effect two wage reductions, combined approximating 30 per cent.

The following shows the rise and fall in wages paid common labor for 10 hours of work by the Steel corporation since 1915.

	Wages 10 hrs	Per cent advance	Per cent advance over 1915
1915	$2.00	..	..
Feb. 1, 1916	2.20	10	10
May 1, 1916	2.50	13.6	25
Dec. 15, 1916	2.75	10	37.5
May 1, 1917	3.00	9	50
Oct. 1, 1917	3.30	10	65
April 16, 1918	3.80	15	90
Aug. 1, 1918	4.20	10.5	110
†Oct. 1, 1918	4.62	10	131
†Feb. 1, 1920	5.06	10	153
†May 16, 1921	4.05	*20	102.5
July 16, 1921	3.70	* 8.6	85

*Reduction

†Basic 8-hour day in effect. Time and a half for overtime.

Sheet and Tin Plate Agreement Signed

A NEW agreement has been signed by the Western Sheet and Tin Plate Manufacturers association with Amalgamated Association of Iron, Steel and Tin Workers, effective as of July 1, as a result of the adjourned conference of their representatives in Columbus, O., this week. Sheet and tin plate mills which were operating under a sliding scale contract with members of the Amalgamated association were closed July 1, following the refusal of the union's officials to concede any of the points contended for by the manufacturers. With the mills shut down, the union agreed to practically all of the demands of the manufacturers. The demand for the products of the mills is still light and the men concurred in the opinion that it was better for them to accept certain modifications than to prolong the period of idleness.

In accordance with the new agreement the rise and fall of tin plate workers' wages will not be so rapid as under the old. Formerly the rate was 1⅛ per cent for each 5-cent advance over $3.50 in the price of tin plate per base box, and a similar decrease when the price fell below $3.20. Under the new arangement the rate will be 1 per cent for each 5-cent rise or decline as in 1915-1916.

This point was conceded by the Amalgamated representatives, and since tin mill crews are working on a $6.50 selling price at present or $3 above base, the elimination of ⅛ per cent represents a reduction in the wages of tin mill crews of 7½ per cent. On a $5.75 selling price the ⅛ per cent concession is equivalent to 5.625 per cent decrease. A reduction also was accepted by the Amalgamated association in the extra pay allowed on tin plate of 14½ square feet or more. In the tin house the rate of advance and decline will be one-half of 1 per cent instead of three-fourths of 1 per cent.

No change was asked for by either side in regard to sheet workers' wages, except that on orders for "pickled" bar or blue annealed steel the workers will receive 5 per cent more than they received for regular orders, instead of 10 per cent extra. The wages to be paid catchers was made the same as that for roughers. The extra man allowed each crew of sheet workers a year ago, which was a disputed point, hereafter will be allowed only from April 1 to Oct. 1, instead of throughout the year, indicating a compromise on this question.

The main objection of the manufacturers against the extra help on sheet mill crews was that the cost of production would show an increase from $1.50 to $2 a ton above competitive interests not parties to the agreement.

The average selling price of sheet and tin plate during May and June on which wages for July and August will be based will be determined in conference this week.

The manufacturers' association estimates that the changes made in the new agreement will result in a net saving to its members of 10 per cent during the next year, while the Amalgamated association states that the wage reductions to which they finally consented range from 5 o 12 per cent.

Considerable interest was aroused by the fact that the Wheeling Steel Corp. one of the largest interests represented in last year's agreement with the Amalgamated association was not represented at the conference, nor were the Wheeling Steel & Iron Co., Whitaker-Glessner Co., and the LaBelle Iron Works, which are part of the corporation. This was considered significant, as the works were forced into the agreement under the stress of war conditions, and it was believed that they may break away from the Amalgamated.

Describes Effect of Coal Strike on Industry

Birmingham, Eng., June 30.—The *Labour Gazette*, journal of the British ministry of labor, describes the effect of the coal strike on the iron and steel trade. It states there was only one blast furnace in operation at the end of May, while there were only 13 tin plate and sheet mills working as compared with 501 a year previous. In the iron and steel works industry employment decreased to 58 per cent of what it was in April and 87.4 per cent from the figure as of June, 1920. "The pig iron and tin plate industries were almost idle, and in the iron and steel trades production had almost ceased at the end of the month," says the *Gazette*.

The number of men employed in the iron and steel industry during the week ended May 31 was 16,706, of which 148 were engaged at open-hearth furnaces, 54 at puddling forges, 12 at bessemer converters, 2219 at rolling mills, 842 at forging and pressing, and 2231 at iron founding.

The percentage of unemployed among members of trade unions from which returns are received by the department rose from 17.6 at the end of April to 22.2 at the end of May, and the percentage of unemployed among workpeople insured under the Unemployment Insurance act rose from 15 at the end of April to 17.6 at the end of May. These percentages did not include coalminers unemployed owing to the trade dispute. The total number of workpeople registering at the employment exchanges as unemployed May 27 was approximately 2,122,000, 1,469,000 being men; 497,000 women, and the remainder boys and girls. On April 29, the total was 1,854,000.

Changes in rates of wages recorded during May affected about 1,570,000 workpeople, of whom about 1,335,000 sustained decreases amounting to over £400,000 a week, and 235,000 received increases amounting to about £55,000 a week.

Trade disputes during May involving stoppage of work affected 1,152,000 persons, as compared with 1,176,000 in the previous month, and 138,000 in May 1920. The disputes involved a loss in the aggregate of about 23,200,000 working days, a decrease of 190,000 days as compared with April. In May 1920, the loss through disputes was 1,170,000 working days. The exceptional magnitude of this year's figures was due to the dispute in the coal mining industry.

Builds New Sheet Mill in East

Plant Is Designed for an Annual Output of 70,000 Tons of Full Finished Stock—Numerous Labor Saving Devices Are Installed—Mills Arranged in Two Units of Six Stands Each

BY E. C. KREUTZBERG

ALTHOUGH steel sheets have been rolled in the east for more than 100 years, the capacity for making this product remained practically stationary in that section until the completion, in the past few years, of the two big new sheet mills in the Baltimore district. Both of them were built by J. M. Jones, a well known figure in the sheet and tin plate industry of this country. The first of these plants, with capacity for making sheets and tin plate, was completed in 1917 and later expanded. It was described in the issues of THE IRON TRADE REVIEW of May 31, 1917, and May 13, 1920. This plant was taken over by the Bethlehem Steel Corp. while still in process of construction, and was operated by Mr. Jones for a year following its completion. The other plant in the Baltimore district is that of the Eastern Rolling Mill Co., organized by Mr. Jones after the termination of his connection with the Bethlehem company.

This plant was laid out primarily to afford a large amount of production with the minimum amount of labor. In planning it, no expense was spared in providing equipment of the most modern character. Particular attention was devoted to labor saving devices, and in so locating the different departments with reference to each other as to necessitate the least possible amount of expense in handling the product. As a result the new Baltimore mill has excited considerable interest among sheet mill engineers and it generally is believed in the trade that when business conditions permit the new plant to operate on full schedule, it will show surprisingly low costs of production.

Specializes on High-Grade Stock

Capacity of the new mill is estimated at approximately 70,000 tons of 12 to 30-gage sheets per year. While black sheets are included, the main product is full-finished stock for automobiles, metal furniture and deep drawing and stamping, and particular attention, therefore, was devoted to installing a complete equipment in the finishing end of the mill. Another feature which received special attention was that of thorough lighting and ventilation. All of the hot mill stands are provided with cold air inlets. The building is provided with three bands of metal sash, of which the top band is for ventilating purposes only. In addition, the wall is provided with openings back of each furnace for cooling purposes. The plant has overall dimensions of 375 x 1000 feet and is in the form of the letter "H." One leg comprises the sheet bar storage department, sheet and pair furnaces, hot mills and other production equipment. The other leg contains the annealing, finishing, shipping and repair departments. The connecting section contains the sheet picklers. Auxiliary buildings include a grease house, a first aid hospital and a supply building. Later a restaurant for employes is to be built.

The sheets bars are brought into the plant on a depressed track and are transferred to the stock floor by cranes, of which there are three spanning the bar storage and the hot mills, each having 80-foot spans and capacity for 25 tons. Adjacent to the bar storage is a 3-arm bar pickler of the Mesta type which is employed for pickling bars that are to be rolled into full finished sheets. From the stock pile the bars are transferred to the shears, of which there are two of the alligator type. After being sheared they are transferred to the heating furnaces by a 10-ton crane. This crane also is equipped with a grab bucket for transferring coal from a pit at the side of the building to a bin which is conveniently located back of each furnace.

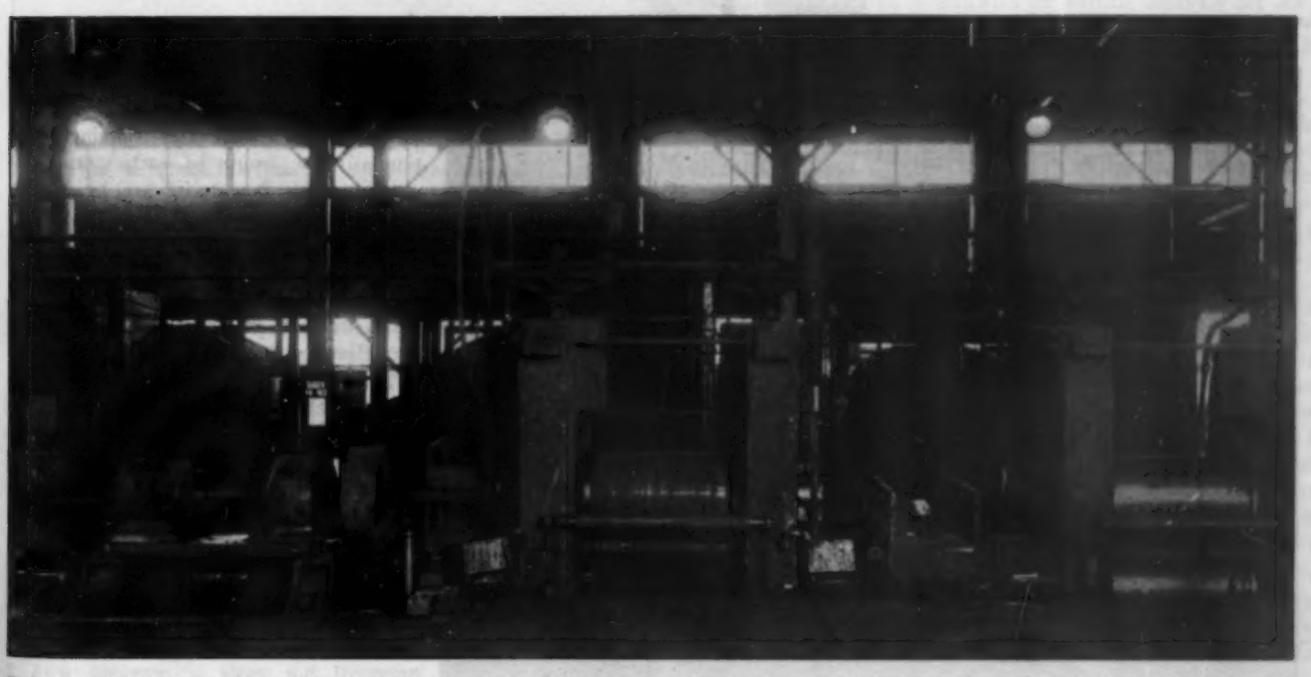


FIG. 1—ONE OF THE BALANCED SHEET MILLS AT THE NEW PLANT OF THE EASTERN ROLLING MILL CO., BALTIMORE

Fig. 2—Annealing Department Comprises 12 Stoker Fired Furnaces Arranged in Pairs. Each Furnace Is Equipped With Electrical Pyrometer

Fig. 3—Acid Fumes From the Three Pickling Vats Are Exhausted Into the Atmosphere by Large Wooden Hoods Built Over Each Machine

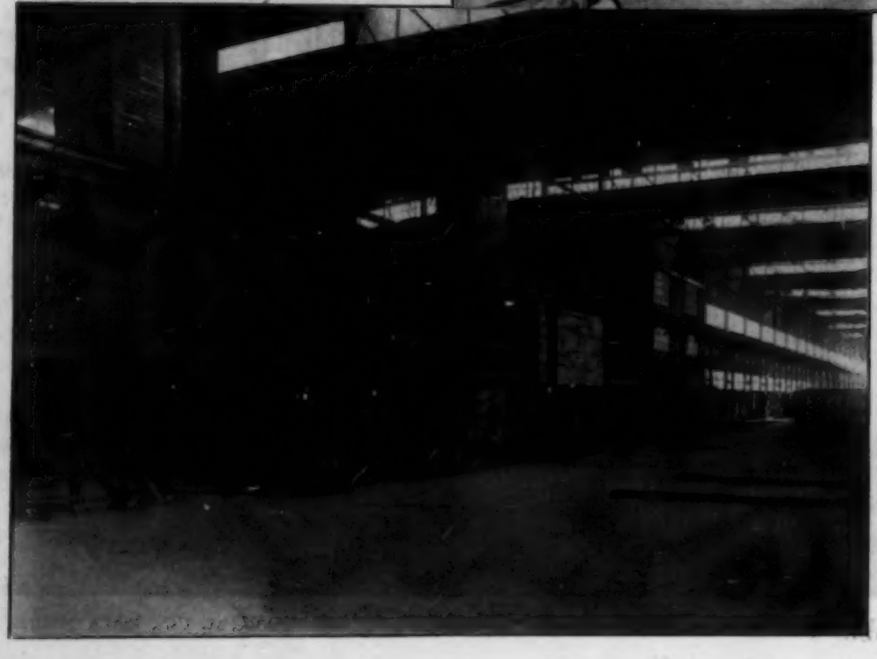


Fig. 4—General View of the Hot Mill Department. The Installation Includes 12 Mills Arranged In Two Groups of Six Mills Each

Twelve continuous pair furnaces and 12 double sheet furnaces built by George J. Hagan & Co., Pittsburgh, comprise the heating equipment. Bars are charged into the pair furnaces by means of hydraulic charging machines of the Allis type. Twelve to 24 pairs are charged at a time and after each batch of pairs has been pushed to the front of the furnace, the charger is pulled back by releasing a weight and another batch of pairs is charged, the complete operation requiring 15 to 20 minutes. The pair and double sheet furnaces are fired with slack coal and are provided with forced draft stokers made by the Combustion Engineering Corp., New York. The draft is provided by means of electric fans. Coal is fed into the combustion chamber of each furnace by means of a worm screw and hopper; the furnaces are grouped into units of six and the stokers are operated by overhead shafts running continuously the length of each unit. Connections with the shafts are by means of worm gears and ratchets and these connections are provided with spring barrels in order to eliminate any danger of breakage of the stoker mechanism. The furnaces are provided with doors for cleaning the grates.

The hot mills, 12 in number, were built by the National Roll & Foundry Co., Avonmore, Pa. These are arranged in two units of six mills each, and each of these units is driven by a 1500-horsepower General Electric Co. motor, the connection being through helical-toothed reduction gears having a ratio of 8 to 1. Eight of the mills are provided with roughing rolls, while four are single, jump mills. Each train of hot mills is provided with 2 stands of flattening, cold rolls; after

being sheared, the sheets are passed through the cold rolls in order to straighten out kinks. The four jump mills are provided with a doubling shear for light gages and small sizes. The hot mills are equipped with steam, water and air and the cold mills with water and air.

The mill equipment includes steam doublers manufactured by the Hyde Park Foundry & Machine Co., Hyde Park, Pa. Opposite the hot mills are six 156-inch shears of the guillotine type, manufactured by the Hyde Park company. Scrap from the shears is baled in hydraulic presses made by the Gallen-Henning Co., Milwaukee. These are so located that the baled scrap may be loaded and shipped in cars from which sheet bars have been unloaded. Auxiliary equipment includes two 48-inch roll lathes located between the two hot mill groups. Operations throughout the plant are by means of electricity. This is obtained from a local service company. A substation containing switchboard and transformer is located in a separate enclosure opposite the hot mills.

From the hot mills the sheets are transferred by means of transfer trucks to the pickle department, which is in the portion of the building connecting the two main portions. Three 4-arm pickling machines of the Mesta type comprise the major units in this department. This department is served by a 10-ton crane and is equipped with a continuous drying furnace; the sheets, after being swilled, are placed on a sprocket conveyor and passed over the flame. Adjacent to the pickling department is a boiler unit of two 250-horsepower boilers which provide steam for operating the machines and for heating the bath.

Equipment in the annealing department comprises 12 furnaces, arranged in pairs. All are fired with coal and are provided with stokers of the same type as those in the sheet and pair furnaces. The annealing units are provided with pyrometers. The department is served by a 35-ton crane with an 80-foot span. All sheets are cold rolled after the annealing process, 16 stands of cold rolls being provided for this purpose. These mills were built by the Hyde Park Foundry & Machine Co. They are driven by an 800-horsepower General Electric motor through a helical tooth reduction gear made by the Falk Co., Milwaukee. Eight mills are located on each side of the motor. They are all served by a 15-ton crane.

The finishing department contains three roller levellers made by R. S. Newbold & Sons, Norristown, Pa., one 156-inch resquaring shear made by the Hyde Park Foundry & Machine Co., one 120-inch Niagara resquaring shear and two stretcher levellers made by the Globe Foundry & Machine Co., St. Louis, and a knife grinder for grinding shear knives. All sheets are passed through the roller leveller and the stretcher leveller is employed for furniture stock and other sheets for which it is specified. Resquaring and oiling are done as specified. For shipping the sheets there is a depressed track with capacity for eight cars. The finishing and shipping department is served by a 15-ton crane with 80-foot span which is provided with a U-shaped cradle for carrying the sheets; carriers of this type, in fact, are located in all departments of the plant. Black sheets which are hot and cold rolled and annealed, without going through any further finishing process, are shipped from a separate depressed track located alongside the cold rolling department. Altogether, the plant is provided with six railroad connections, two for receiving coal, one for receiving sheet bars, one for receiving supplies and two for shipping.

Auxiliary departments which are located in the section of the building devoted to annealing, finishing and shipping, include a 72 x 45-foot repair shop, a 48 x 45-foot blacksmith shop and a 48 x 45-foot electrical repair shop. These are served by a 5-ton crane which also is employed in handling coal for the annealing department and the boilers.

The Eastern Rolling Mill Co.'s building is of the Aiken monitor roof type. The sides are of corrugated steel, provided with metal sash as previously described. The floor is of paving brick, with the exception of that in the finishing and shipping department which is of wood blocks. Water for the various departments is obtained from a huge standpipe at the plant.

FIG. 5—GENERAL VIEW OF THE COLD ROLL DEPARTMENT WHICH INCLUDES 16 STANDS OF ROLLS DRIVEN BY AN 800-HORSEPOWER MOTOR

Officers of the Eastern Rolling Mill Co. are: President and general manager, J. M. Jones; vice president, C. E. F. Clarke; secretary, L. J. Jones; treasurer, J. A. Downey. A. J. Hazlett is sales manager. H. A. Thompson is assistant sales manager. C. A. Pennock is general superintendent, and J. E. Cook, assistant general superintendent. The following constitute the board of directors: J. M. Jones, Waldo Newcomer, F. B. Cahn, F. W. Wood, L. J. Jones, J. T. Hill, C. C. Pusey, all of Baltimore; J. E. Alred, C. E. F. Clarke, R. M. Smith, of New York; and A. W. Thompson, of Pittsburgh.

Solving the Frequency Problem

In Purchasing Electric Power from Large Central Stations Steel Mills Are Facing Problem of Applying 60-Cycle Current to Plants Designed for Lower Frequency—Possible Solutions Outlined

BY B. G. LAMME

ABOUT 15 years ago steel mill engineers, recognizing the advisability for standardization of certain requirements in connection with mill practice turned to the question of choice of frequency. At that time all the electric power used by the steel mills was produced in their own plants, and in many cases, such plants were of relatively large capacity compared with central stations. Apparently the advisability of the generation of their own power was not questioned as this was the only means by which they could obtain electric power.

Since only two frequencies, namely 25 and 60 cycles, were in general use in this country, the steel mill engineers confined themselves to a comparison of these two and their fitness for steel mill work in general. Three conditions of service required special consideration. First, the operation of large, slow speed induction motors; second, the transformation from alternating to direct current; and third, the parallel operation of slow speed, gas engine driven generating sets.

Much of the heavier service of the steel mills was contemplated at relatively low speeds with direct-connected motors, or with as little gearing as possible on the basis that large, high-speed, high-power gears would not be satisfactory. As motors up to 6000 horsepower, nominal rating, with speeds of 75 to 90 revolutions per minute, were considered necessary in certain applications, it appeared that 25 cycles was far better than 60, both from the standpoint of the general performance and the first cost.

Higher Speeds Now Obtained

In transformation to direct current, both synchronous converters or "rotaries" and motor-generators were recognized as possible methods. With rotaries, 25 cycles offered by far the better proposition, compared with the 60-cycle rotaries of that time; whereas with motor-generators, little difference existed. With induction motor drive for motor-generator sets, naturally the lower frequency offered advantages, while with synchronous motor drive, the 60-cycle was better. It must be borne in mind that in those days the high-speed, direct-current, commutating-pole generator was not yet developed, thus then relatively low speeds of motor-generator sets, 25-cycle synchronous driving motors were fairly comparable with 60 cycles, while with induction motor drive the advantage naturally was with 25 cycles. The coming of the commutating-pole direct-current machines with consequently much higher speeds has greatly changed the situation, as will be referred to later.

The third condition mentioned, parallel operation, is one which concerned gas engine drives principally. It was the belief that by using furnace gases with suitable large, low-speed, gas engines, the most economical generation of power would be obtained. The Gary, Ind., plant is an illustration of this early tendency. It was well known that 25-cycle parallel operation of alternators with gas engine drive was a much easier proposition than with 60 cycles, and even with 25 cycles there were some doubts regarding successful paralleling.

Represents Extreme Conditions

The Gary plant should be referred to further as an illustration of certain extreme conditions undertaken in some of the earlier pioneering in electrification of steel mills. All equipment was more or less new and special. In this early plant were many conditions of motor drive which, even with very slow speed motors, still required huge gears for further reduction in speed. Some of the ultimate speeds, at the load, corresponded to six to ten revolutions with direct-motor drive, obviously representing impossible conditions as far as direct motor applications were concerned. Even with gearing, the conditions of motor drive were such that 60 cycles would have represented impracticable conditions, thus 25 cycles was a practical necessity in this plant as designed. As a matter of fact this plant had a decided influence in fixing 25 cycles as a standard for steel mill work.

Considering all the various conditions, the steel mill engineers decided definitely upon 25 cycles as the future standard for generating plants. A standard of 6600 volts was also decided upon, although this was not considered as of first importance, and practically amounted to setting an upper limit. Considerable use was needed for lower voltages such as 2200, in fact, experience has shown that 2200 volts is used more than 6600 in the smaller plants.

The choice of 25 cycles at that time undoubtedly was the correct one, with the knowledge and experience available, and it may be stated emphatically that no real mistake was made in this choice. Had 60 cycles been chosen instead of 25 cycles, it is probable that steel mill electrification would have been handicapped greatly in many ways and would not have reached the present advanced stage of development.

The Problem

OWING to the gradual changes taking place in the method of generating electric power for industrial use, many large steel mills are now facing the problem of utilizing alternating current from central station lines in equipment which was designed for current of a lower frequency. Not many years ago when each large steel company operated its own power plant, 25-cycle current was used almost exclusively. Now, however, with the central station system well established and gaining in popularity every day, there is a marked tendency toward the use of 60-cycle current. As can well be imagined the problem of utilizing the 25-cycle equipment in conjunction with 60-cycle current is a serious one.

In the accompanying article B. G. Lamme, chief engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., outlines the problem and mentions five possible solutions. In conclusion, he declares that each case must be judged on its own merits and outlines a policy which has regard for the standardizing of equipment in the future. The article is abstracted from a paper presented at a recent meeting of the Cleveland chapter of the Association of Iron and Steel Electrical Engineers.

New conditions have arisen in recent years, however, which have changed the complexion of the problem to a certain extent. Fifteen years ago it was believed, quite generally, that 25 cycles would be the future power frequency of the country on account of its general advantages in generation, transmission, utilization and transformation to direct current. If this was true of the general problem, it applied still more positively to the steel mill situation. The whole trend for large power service seemed to be toward 25 cycles; but, for lighting purposes, 60 cycles was favored as being by far the more desirable frequency.

From the central station standpoint, however, the situation changed gradually. One of the main handicaps of the 60-cycle system was the greater difficulties in transformation to direct current. The 60-cycle rotary converter, while operative in a fairly satisfactory manner in some applications, was considered quite unsatisfactory in others. This meant that motor generators were required in connection with 60-cycle generating plants, while, with 25 cycles, rotary converters were used almost exclusively. Thus the large generating plants for operating direct-current railway service and those for operating the three-wire direct-current Edison systems went almost exclusively to 25 cycles, mainly on account of the advantages of rotary converters over motor generators. Improvements in the 60-cycle rotary converter appeared about 15 years ago; nevertheless, the machine being of the noncommutating pole type, was of relatively low speed with many poles and was unduly complicated and expensive and inefficient. The coming of the commutating poles in direct-current generators was followed several years later by the use of similar poles in rotary converters, beginning about 1911.

Higher Frequency Receives Attention

The use of commutating poles on rotaries immediately opened the way to very much higher speeds, so that within a year or two after their introduction, the speeds of both 25 and 60-cycle rotaries began to climb at a rapid rate. The 60-cycle rotary had the advantage for soon the 25 cycle-machine reached its limiting minimum number of poles; whereas the former machine could go to materially higher speeds before reaching such limits. Consequently the 60-cycle rotary, in the smaller capacities especially, soon outran the 25-cycle, while in larger machines it made such a good showing relatively that it put the 60-cycle generating system nearly on a par with the 25-cycle from the standpoint of transforming to direct current.

In the development of induction motors, the tendency also was toward higher speeds. In the small sizes of 25-cycle induction motors, little choice is given in speeds on account of the few combinations of poles which are possible. Here 60-cycles presented material advantages in offering much higher speed machines for general power purposes with resultant lower first costs. Revolutions of 1200 and 1800 corresponding to six and four poles, respectively, became common practice on 60 cycles; whereas 750 revolutions per minute was practically the nearest corresponding 25-cycle machine. Of course, 2-pole, 1500 revolutions per minute, 25-cycle machines are possible, but it happens that for constructive reasons, the 2-pole machine does not show any material advantage in cost or otherwise over the 4-pole machine.

From the standpoint of power generating units, 60 cycles also presented advantages. In the earlier days of the turbo-generator, the 25-cycle, two-pole, 1500 revolutions per minute unit was favored over the 60-cycle, 6-pole, 1200 revolutions per minute machine of corresponding capacity. However, with the use of higher speeds, which has occurred in the turbo-generator practice as well as in other lines of electrical design, the 1200 revolutions per minute, 6-pole machine was dropped in favor of the 1800 revolutions per minute, 4-pole machine, thus placing the advantage somewhat in favor of 60 cycles. Moreover, up to 5000 kilowatts a 3600 revolutions per minute, 2-pole machine at 60 cycles became possible; whereas the best that the 25-cycle frequency could offer was 1500 revolutions per minute.

Transformers Are Made Lighter

In transformer development in the early days, 25 cycles appeared to have all the advantage, due to the fact that the iron losses were relatively much lower and the iron in the magnetic circuit could be worked at very much higher flux densities. With improvements in the quality of transformer steel, however, such as the introduction of silicon steel, it was found that with either 25 or 60 cycles the flux densities could be worked up to such a point that saturation of the magnetic circuit, and in consequence the magnetizing current itself, became one of the limiting conditions. Thus 25 cycles represented lower losses in the transformer iron, which were more than counterbalanced by the increased quantity of iron required. In later development the 60-cycle transformer, has proved to be materially smaller, lighter and cheaper than its 25-cycle competitor.

Thus it may be seen from the few indications given above, that there were strong reasons for the trend toward 60 cycles for general power generation and distribution. The transmission advantages at first seemed to be in favor of 25 cycles. Transmission voltages, however, soon rose from 11,000 to 22,000, 33,000, 44,000, 66,000, 110,000, 132,000 154,000 and now 220,000 is to be tried out soon. With these higher voltages the 60-cycle transmission has proven to be sufficiently satisfactory; so that considering generation, transformation, transmission, distribution and the nature of the load, the advantages have been con-

Possible Solutions of the Problem

FIVE solutions of the frequency problem are open to the engineers and operators of mills in which alternating current is used. They are as follows:

1. Rebuilding, or obsoleting existing plant and replacing entirely with 60-cycle equipment.
2. Conversion of 60-cycle purchased power to 25 cycles by frequency changers and operating in connection with existing plants. This retains the advantage of the existing 25-cycle system, but results in considerable losses due to the frequency changers.
3. Allowing the existing 25-cycle plant to remain in service, and installing new generating and motor equipment for 60 cycles. This would allow purchased 60-cycle power to be utilized in connection with the new generating plant. This, however, involves a more or less mixed system throughout the plant.
4. Retaining the existing 25-cycle plant for those parts of the service where 25 cycles are materially better, and changing other parts to 60 cycles for use on purchased power. This could be continued until the old plant and equipment became obsolete and probably would result in a mixed system throughout the mills for years to come.
5. Utilizing the existing plant within certain areas and applying 60-cycle purchased power to extensions and new areas. This involves a double system, but not a general mixture of two systems in the same areas. Eventually if the purchased power proves more satisfactory than the local supply, the latter could gradually be obsoleted. This means, however, that in the new areas the 60-cycle would be applied to slow speed motors as well as all other apparatus.

siderably in favor of 60-cycle type.

Large central stations for general power supply were almost unknown 15 to 20 years ago. There were lighting stations, railway stations, and power stations furnishing individual industries, but there were practically no central stations for the general supply of power, as have developed during the past few years. With the gradual recognition of the advantages of centralized power plants, the smaller lighting and general power distributing stations began to expand and reach out toward the isolated and special service plants. Gradually as the central stations increased in capacity, they made special power rates to the railway companies and to the industrial plants, which were better than these plants could obtain from their own generating plants. Consequently, the tendency has been toward shutting down the individual plants, with purchase of power from the central plant. This action has been cumulative, for the more load taken over by the central plant, the bigger the central plant became and the better rates it could make. In this growth the tendency has been largely, and in recent years almost exclusively, toward 60 cycles as a general purpose frequency.

Naturally, in reaching out for more load, these large central power plants have included the steel industry along with other industries, and this is where the steel mill problem of frequency has become prominent. As many of these steel mills, especially the older ones, are already equipped for 25 cycles, the problem has been that of best adapting the 60-cycle frequency where power is to be purchased.

In former days, the steel mill could compete favorably with the central station in the cost of power, but with the increased growth of the central power stations and their lower rates for power, the steel mills are tempted toward the purchase of power. Although the steel power plant may be able to generate power as cheaply as it can be purchased, it still is not, in itself, an attractive investment as capital is not, usually invested without the expectation of a reasonable return. Some of the steel mill engineers have said, the business of the mills is to produce steel and not to manufacture power, therefore, they cannot compete with those whose sole business is the manufacture and sale of power.

One condition which lends itself toward the use of 60-cycles in steel mill work is the increased use of gearing thus allowing higher speed motors. For many kinds of service gearing now is used where direct connection formerly was considered the only method. In consequence, the speed of steel mill motors averages much higher.

On the other hand, certain prejudices exist against large gears for heavy service, based upon more or less unfortunate experiences, but through greater experience and more suitable types of gears this prejudice is disappearing. As in everything else considerable development has been made in the gear situation to meet many of the applications and while individual cases may exist where gears are not favored, it is admitted that the general tendency in recent years has been toward higher speed motors with gearing. Regardless of whether or not it represents the best engineering, the trend is toward such gearing, and as a rule, where a trend persists it must sooner or later become recognized as desirable practice.

Operative slow-speed motors can be built for 60 cycles as well as for 25 cycles, but with lower power factor or with high cost. In some cases, lower power factor may not be an important item. With equal power factors, a slow-speed 25-cycle induction motor is inherently smaller and cheaper than the corresponding 60-cycle motor, this being a fundamental difference. On the basis of equal costs of motors with quite different power factors, additional cost of power factor correction should be included to make the two cases comparable. However, it is only in the slow speed induction motors that 25 cycles represents any material advantage. Should plant equipment consist largely of slow speed induction motors, the 25 cycle frequency would represent a most nearly ideal arrangement, but few plants, if any, utilize larger part of the total power in such motors. Taking all the other service into account, probably it will be found that there are few plants in which 60 cycles cannot make practically as good showing as 25 cycles. In other words, where the slow speed service represents but a relatively small part of the total service, it may be better to make some sacrifices in this smaller part to the advantage of the whole.

The question of purchase of 60 cycle power is dependent upon many conditions. In the Pittsburgh district, for instance, the total electric power used in the various steel mills may represent the equivalent of a huge power plant in itself. Were the various mills to combine their power plants into one general plant, the capacity of such plant and the conditions of operation probably would be such that it could compete favorably with any large central station, and in such case 25 cycles could be the frequency. Moreover, this would remove the manufacture of power from the mills themselves and place it in a plant whose sole business

Each Case Must Rest on Own Merits

THERE is no good general solution to this frequency problem and each case must be handled on its merits, taking the future tendencies and growths into account. In many cases it appears that the large existing 25-cycle local systems should be retained, at least until such time as the need for replacement is more obvious than at present. Unless the future service of the mill shows strong indications of going almost entirely to 60 cycles, a mixed generating plant is not to be recommended. In those cases where existing 25-cycle power and purchased 60-cycle power are both to be used, they should at first have their own individual services or areas, as far as possible, to avoid indiscriminate mixing of services throughout the mills, and to avoid frequency changers with their attendant losses, unless conditions are such as to warrant their use. In general, where both frequencies probably will be used for some time to come, and there is any real necessity for a tie between the two, then frequency changing becomes a necessity. As central station service now has become reliable, there is not the need for a tie between two frequencies as was formerly the case, thus in many cases, frequency changers can be eliminated.

A new plant expecting to generate its own power should be installed at 60 cycles, if located in a 60-cycle district, because of future possibilities. The present growth in 25 cycles appears to be limited to existing plants which may never be replaced by 60 cycles. In consequence of this mixed service, the ultimate solution of the general supply problem may mean 60 cycles for general purposes, with 25 cycles as an auxiliary supply.

would be the manufacture and supply of electric power. It may be suggested at this point that furnace gases are used to a greater or less extent under the boilers or power plants and that with the power plant placed elsewhere these gases would be wasted. However, there is little doubt but that other uses would be found for such gases, for some of the steel mills at present find uses for furnace gases without burning them under the boilers.

In considering a single large power plant, the Pittsburgh district represents very unusual conditions in that many large steel plants are concentrated within one relatively limited district. A combined steel power plant in the Pittsburgh district, therefore, would represent a special rather than a general condition and would furnish the solution of the problem for only one general district. In other districts the problem of 60 cycles versus 25 cycles would still hold and would have to be met.

Classification of Frequency Solutions

With this question of purchase of power before them, a number of the steel mills throughout the country which have been planning to increase their power plants, are faced with the question of installing an additional plant at 60 cycles instead of 25 cycles. The purchase of additional power at 60 cycles involves numerous problems in the application of such power to the existing equipment. Probably as good a way as any to consider the problem is to classify the various methods by which the double frequency situation could be met. These methods may be classified under five headings as shown in the accompanying table, the order in which they are given, however, not representing their importance.

Looking at the matter broadly, it does not seem advisable to generate two separate frequencies in the local plant. In other words, if 25 cycles is the existing frequency, it is not desirable to install an additional generating plant at 60 cycles, unless such new equipment is to be of greater capacity than that already installed. In this latter case it might be advisable to install the additional plant of 60 cycles, with the understanding that the older small 25 cycle plant soon will be superseded entirely. In other words, the only condition under which the two frequencies should be mixed in the one generating plant, is that in which one of them is to be abandoned entirely within a reasonably short time. However, wherever the additional plant, is to be smaller than the plant already installed, it would be better to install the additional plant at the same frequency that was being used.

Some of the large central stations have encountered a similar problem. In some of these, both 25 and 60 cycle generating units have been installed in the same plant, but as a rule, they supply different service and areas. For instance, the 25 cycle service will be utilized almost entirely by conversion to direct current, and within a given district this will apply exclusively. In other cities the 60 cycles may be represented by entirely separate power plants supplying outlying districts mostly, a large part of the application being by direct service instead of by conversion to direct current. So far as the writer knows, in general, the two services are not mixed indiscriminately.

It has been suggested that in the application of 60 cycles to steel mills, this might be used largely for one kind of service, such as the motor generators or rotaries for producing direct current. In this way the 60 cycle service need not be distributed generally throughout the mills, but would be supplied to the converting machinery which is not scattered through the mills in the same way as the motors. Moreover, the modern 60 cycle synchronous motor-generator is just as economical as its 25 cycle competitor, more economical in some cases, while the 60 cycle rotary converter, if transformers are included, approaches relatively close to the 25 cycle in general operating characteristics.

In existing mills, changing to 60 cycles would mean replacing or remodeling at very considerable expense the existing motor-generators and rotaries, and unless the future growth of such apparatus is to be very large compared with that already installed, this reconstruction or replacement might prove in the end to be relatively expensive. Installation of frequency changers, which would allow the continuation of the existing 25 cycle frequency might become necessary. Even if the existing machinery is more or less out of date, probably it can be kept in service for many years to come, for much of this machinery is well built and of durable construction, having perhaps 20 to 30 years of good operative life. In fact, some of the motor generators and rotary converters which have been in operation for 10 to 20 years in steel mills appear to be as good as when first installed and it will be difficult to justify their obsolescence and replacement.

Something might be said further regarding frequency changers. As stated before, the function of the frequency changer is to change frequency, a conversion accomplished at a considerable expense in power. Other objections outside of inefficiency count against the frequency changer, but these probably would not be dominating or controlling in themselves. On the face of it, the frequency changer seems to furnish such a simple solution of the frequency problem that in some instances it pays to sacrifice other considerations in favor of simplicity.

It must be borne in mind, in the first place, that there are no means for getting the exact 60 to 25 relation with an economical type of machine, for the numerical ratio of 60 to 25 allows only a 24-10 pole combination, which represents a rather low speed except for units of enormous capacity. If any other more economical combination of poles is chosen, such as 10-4 or 14-6, then, with a 60 cycle supply system, some other frequency than 25 cycles will be obtained. The 10-4 pole combination gives 24 cycles, while the 14-6 pole combination gives 25.7 cycles. Therefore, for either of these combinations, it would be necessary to change the steel mill frequency slightly. If either of the above combinations were to be adopted, the 10-4 pole is preferable from the standpoint of the frequency changer itself, but some question arises regarding the use of 24 cycles instead of 25 cycles in steel mill applications, for this means a general reduction of 1 per cent in the speed of all the synchronous and induction motors. Again, the use of the 14-6 pole frequency changer would mean increasing the mill frequency about 3 per cent which should not be as objectionable as a reduction of 4 per cent. The 14-6 pole combination, however, would not represent an economical frequency transformation.

Machinery Cost Is Low

In installing new or additional power plant, the cost of the electric machinery represents but a small part of the total cost and unquestionably the extra buildings and equipment to go with the frequency changer would be materially less than that of additional generating plant. This saving in first cost, in some cases, might go a long way toward offsetting the losses of the frequency changer, especially in those cases where 60 cycle power can be obtained at a very low rate. However, no definite statement can be made as to the comparative costs.

As soon as two or more frequency changers are to be installed in one plant, these to be operated in parallel with each other and with the existing generating plants, then complication comes in, possibly to such an extent as to lose most of the simplicity of the

(*Concluded on Page 97*)

Turning Up Trade in Morocco

Market Is Good for American Products "If Prices Are Right"—Automobiles Made in United States Predominate—Spaniards and Germans Control Concessions —A Sketch of Resources and Sales Possibilities

BY FRANCIS MILTOUN
French Correspondent of The Iron Trade Review

IT'S a short day that will not turn up some business for the salesman in Morocco if prices and goods are right," said a French traveler, selling American machine tools to the French correspondent of THE IRON TRADE REVIEW *in Casablanca, the chief seaport of Morocco. After an investigation of the situation, the correspondent concludes that "this is the keynote of the Morocco of today." As he points out, there is a great demand for metal products, and all imports are taxed uniformly, putting international traders on a uniform basis. Mr. Miltoun gives an interesting account of Morocco's resources, as the background for his observations on trade possibilities.*

THE North African provinces of France, so to call them, have but a small equipment for producing or fabricating iron and steel, although Algeria and Tunisia are believed to have 500,000,000 tons of iron ore in sight. What Morocco's actual resources are no one knows specially, but they are believed to be great. Certain it is that the known combined Spanish-Mannesmann, German, concessions in the zone of the Rif are indicative of much more that remains to be exploited profitably.

The resources within French control may be depended to add greatly to the nation's wealth. Algeria alone, during the last three years, shipped from 750,000 to 1,500,000 tons of iron ore per annum to foreign countries, while Tunisia, in 1917, exported to foreign countries 51,313 tons. The districts of these shipments, Algeria forwarded 782,000 tons to France, and Tunisia, 406,000 tons.

It is interesting to note the small imports to this district in 1919, as indicative of the rudimentary civilization still existing: Coal, 2597 tons; coke, 1 ton; iron and steel products 190 tons and steel scrap, 39 tons.

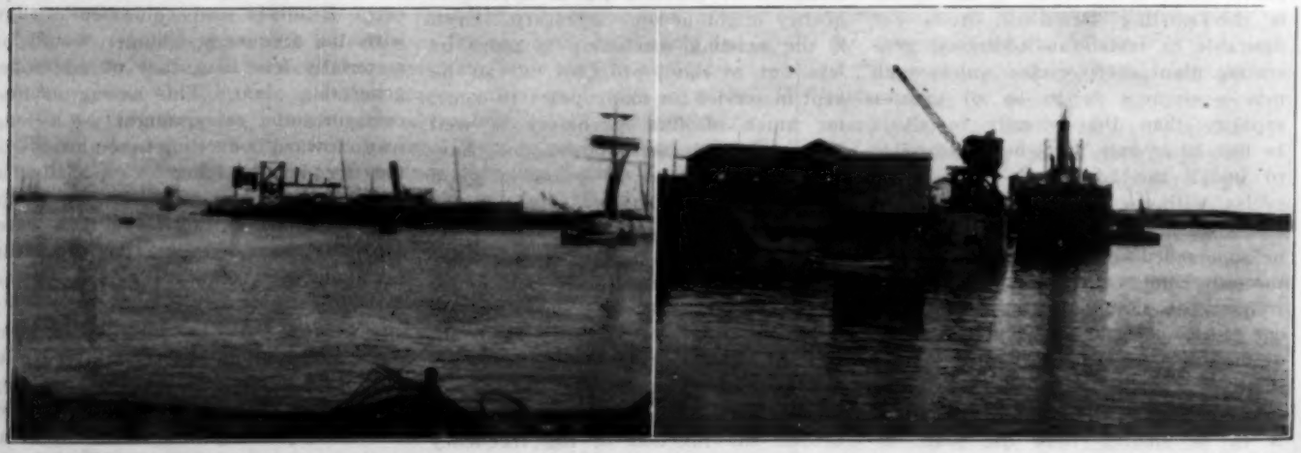
In the French Moroccan protectorate mining laws have been formulated, and many concessions granted which to date have produced little or nothing. A great deal depends upon European immigration and the training of native Arab or Berber labor. There is also the great question of transport to the chief shipping point to Casablanca on the Atlantic coast, which development is only dimly outlined. Skilled labor is sure to be European; native labor can be relied on only for prolonged muscular effort in this climate. Only reasonably important exploitations are assured of success.

Mining laws are based upon various decrees, or dahirs, and are so liberal as to make prospecting and exploitation reasonably encouraging. Exploitation concessions for iron and fuel are granted upon payment of 500 francs for the license and an annual charge of 1.50 francs per hectare (2.5 acres) exploited the first year, 2.50 francs the second year and 3.50 francs the third year and after. An export tax of 3 per cent ad valorem is imposed on all exports of minerals, except gold which carries an export tax of 10 per cent. Special reservations are made with respect to phosphates, nitrates and other mineral salts and petrol, of which latter there are supposed to be workable fields in the neighborhood of the internationalized city of Tangiers. So far, exports of mineral products from the French protectorate have been nil, the French occupation only having started with the years just previous to the war, and the machinery of government just beginning to operate.

No statistics as to the Moroccan possibilities are available, save with respect to the Rif. It is known that hundreds of German applications for mining concessions were entered previous to the war. The three principal operating companies of this district, owned by Spaniards and Germans, show the following shipments of iron ore, in metric tons, from the port of Melilla since 1913:

	Companía Espanola Minas del Rif.	Ciaa. del Norte Africano, Alicantina Hoschaonana	Companía Setolazar
1914	6,100	.....	.....
1915	63,398	13,602	3,850
1916	125,659	51,721	22,459
1917	120,979	33,169	45,181
1918	201,719	5,507	61,606
1919	174,017	44,597	55,209

Morocco made the following importations in metric tons, of iron and steel, chiefly rolled products, beams,



NEW HARBOR WORKS AND LOADING CRANE AT CASABLANCA, THE CHIEF PORT OF MOROCCO, AND, AT THE RIGHT, THE HARBOR AND WHARF AT KENITRA, THE MOST INLAND PORT OF MOROCCO, ON THE TIDAL RIVER, SEBON, FROM WHENCE IRON ORE WILL BE SHIPPED

AMERICAN AUTOMOBILES PREDOMINATE ON THE GOOD ROADS OF MOROCCO—AMONG THE INTERESTING GLIMPSES ALONG THE WAY IS THIS LITTLE FOUNDRY AT RABAT, THE MOROCCAN CAPITAL

plates, sheets and strips, in the years noted:

From	1915	1916	1917	1918	1919
France	1085	226	383	583	1230
England	62	25	112	403	1378
Spain	.5	.19	793	224	227
Belgium	19	6	2	...	882
Italy	...	...	...	10	...
United States	...	...	...	330	1234
Sweden	...	...	...	...	61
Other countries	111	39	2060	...	687

Without question, since the country of origin is not specifically stated, actual imports from the United States by way of France or England were considerably more than shown. American automobiles predominate, though by far the larger number in the country were transhipped from other countries.

There is a vast business to be carried on when port facilities have been completed and railway lines have been extended throughout the country. These improvements are now in progress. Morocco is buying "from hand to mouth." This may be Belgian rails and spikes for a light, narrow-gage railway at some tidal river port like Kenitra, or it may be structural iron or steel, or compressed air appliances, from the United States, which are carried in stock at Casablanca. The demand is great, for manufactured metal products, from automobiles and trucks to mild steel in strips for the natives to fashion into knives, tin kettles or teapots. Again, the demand may be for tin plate which natives use largely for making dishes, or for armoring the doors of their houses and shops, which is a universal practice, as is the employment of the padlock of iron, steel or brass, almost to the exclusion of any other form of lock manufactured.

"It's a short day that will not turn up some business for the salesman in Morocco if prices and goods are right," said a French traveler, selling American machine tools, to the waiter in the Hotel Excelsior, Casablanca. This is the keynote of the Morocco. Aside from the necessary machine shops, an occasional small foundry or a small ship-repair plant there is no metallurgical or metal working industry in Morocco today. For that reason the country is, and will be for a long time dependent upon outside supplies of everything but the most rudimentary metal products. England, Belgium and France seem to be sharing the market between them for light and heavy finished products, though a certain amount of the latter has been imported direct from the United States.

All imports into Morocco are taxed a uniform 12½ per cent. ad valorem which puts international trading on an equal basis. Perhaps it is this that accounts for the relatively large number of American automobiles in the country. It should help other manufactures in the same way.

Frequency Problem

(*Concluded from Page* 95)

scheme. The synchronizing and proper paralleling of two or more frequency changers with each other and with their respective power plants is difficult but can be carried out successfully.

Attention should be called to the fact that if any particular combination of frequency changer sets is chosen such as represented by 10-4 poles, or by 14-6 poles, then this exact ratio must be retained throughout, if additional frequency changers are added to the plant.

As to the capacities of such apparatus which are practicable in single units, 10-4 pole sets of 5000 kilowatt-ampere capacity have been offered recently by manufacturers. However, for capacities larger than 5000 kilowatt-amperes certain difficulties arise, as the next possible pole combination is 20-8, which represents just half the speed. Halving the speed, even with a 10,000 kilowatt-ampere set, probably will more than offset the gains in cost and efficiency resulting from larger capacities. One would assume, therefore, that two 5000 kilowatt-ampere units would be preferred to one 10,000 kilowatt-ampere, and presumably this is correct, if the two units can be operated independently.

For costs and efficiencies of such apparatus, the following very approximate figures are suggested:

For a 5000 kilowatt-ampere set including auxiliaries, switchboard appliances, etc., from $10.00 to $11.00 per kilowatt-ampere. The combined efficiency will be approximately 92 per cent or better at full load and 89 per cent or better at half load.

For a 10,000 kilowatt-ampere set, having 20-8 poles, the cost per kilowatt-ampere could be taken roughly at $11.00 to $12.00. No figures for efficiency have yet been worked out.

One other class of electric machinery used in steel mills is the induction motor speed-regulating set which is coming into use to a considerable extent in recent years. There are three types of such speed regulating appliances in use today, all of them requiring commuting machinery, namely, (a) those in which the secondary electrical power of the induction motor is transformed into the mechanical power and utilized as such; (b) those in which the secondary electrical power is transformed into direct current and utilized; and (c) those in which the secondary power is transformed from the variable or adjustable frequency of the secondary to some fixed frequency such as that of the line and thus utilized. The first of these schemes involves polyphase commutating type motors; while the second requires rotary converters; and the third requires commutator type frequency changers.

American Malleable Cast Iron

A Series of Related Articles Dealing with the Development of the Industry, Modern Methods of Manufacture, Metallurgical Principles Involved and the Properties of American Malleable Iron

BY H. A. SCHWARTZ

Chapter XIV—Cupola and Open-Hearth Melting

IN ADDITION to air and electric furnace melting, which was discussed in Chapters XII and XIII, there are two commercial methods of melting malleable. That which employs the cupola can be dismissed with a few words, since its use for producing specification metal has been prohibited by the specifications of the American Society for Testing Materials since their first revision.

The objections to cupola metal are based on lack of uniformity of product and lack of control. Because of construction of the cupola and its method of operation, no large amount of liquid iron is accumulated at one time; therefore there is no assurance that successive taps will be even nearly the same in composition unless the charge consists of only one material, which manifestly is impracticable.

These variations are of no consequence in the general run of gray iron castings, but in malleable practice with its much reduced practicable range of composition they are prohibitive, especially for large work. Furthermore, since the cupola runs continuously for several hours there is no means of judging the fitness of the iron for its intended purpose either by analysis or fracture before it is poured.

Control of Metal Limited

Even when the best possible uniformity is secured the cupola process has limitations of control which render it unsuitable in the production of a general run of malleable castings. The molten iron runs down through a mass of incandescent coke, meeting in the spaces between the coke a stream of gas, originally air, but converted into a mixture of carbon dioxide, carbon monoxide and nitrogen by the fuel.

Under any given operating condition, especially as to temperature, a definite equilibrium exists which determines the composition of the products of combustion in contact with incandescent carbon at that temperature. The descending liquid iron thus passes into a zone in which temperature and gas composition are adapted to equilibrium with molten iron of only one specific carbon content and capable of adding or removing carbon easily if the metal comes down lower or higher than this value in equilibrium with the gas phase. Therefore a cupola produces metal of a carbon content almost independent of that of the charge and dependent solely on the combustion conditions.

The possible range of working conditions is such as to produce metal containing from about 2.70 to 3.25 per cent carbon—a value too high for the production of a high class product except in very small work. The sulphur content of cupola metal also is invariably high in view of the intimate contact of molten metal and fuel.

Some cupola metal made for extremely small work thus is converted into white heart malleable, possibly without the full understanding of the operator, and the work is annealed by decarbonization of the thin sections and not by graphitization.

The surviving successful application of the cupola process to black heart malleable is in the manufacture of pipe fiittings where the product usually does not have the greatest possible strength.

The metallurgy of cupola melting has been considered in Chapter XIII in connection with the triplex process. However, a lower fuel ratio is common in ordinary cupola melting than in the triplex process because the iron must leave the cupola at a higher temperature in order to run into molds than if it is to be handled only by a crane ladle.

A ratio of metal to fuel of between 4 to 1 and 6 to 1 may represent operating practice, and this represents the one great advantage of the cupola—cheapness both of construction and operation, the utilization of heat being about two or two and one-half times as efficient as in the air furnace.

Open-hearth melting, especially when large tonnages and continuous operation are involved, should be a desirable method of operation. That its practice is confined to relatively few plants may be due to the conservatism of the industry and to the tonnage limitation.

In general, the open-hearth furnaces used in the malleable industry are similar in construction to those used in steel making and in size represent the lower limits of capacity used in that industry. Some experimental heats have been made in basic furnaces but acid lined furnaces apparently are used for commercial operation.

The melting operation is similar in principle to air furnace melting, except in the application of the heat.

Furnaces ranging in capacity from 5 to 20 tons have been used, the larger units being preferred when practicable. The furnace roofs are of silica brick and the bottoms of silica sand. The regenerative system upon which the operation depends is so well known as not to require description. The products of combustion leaving the hearth pass through checkers of fire brick and impart their heat to these brick. When the brick is thoroughly heated the direction of gas passage is reversed, the air being drawn into the furnace through the previously heated checkers. The products of combustion pass out through checkers at the opposite end of the furnace. When producer gas is used it also is preheated. The incoming air gradually cools the hot set of checker work while the products of combustion heat the checker at the outlet end when the latter grow hot the direction of passage is again reversed, this operation being continued.

Using Heat of Flue Gases

The period of reversal depends upon the heat capacity of the checker work and in ordinary design a reversal every 15 to 30 minutes may be contemplated. The object is to utilize the sensible heat of the flue gases. The gases leaving the iron cannot im-

part heat thereto unless their temperature is above that of the metal. However, their heat can be imparted to the furnace content by using it to preheat the air and sometimes the fuel used before the combustion begins. In this way a higher furnace temperature and lower heat loss is maintained.

The heat loss depends upon the temperature of the out-going gases and this in turn upon the volume of the regenerator chambers and the period of reversals. In theory the outgoing temperature might be reduced to that of the incoming air and gas but this is practically impossible.

Campbell states that open-hearth steel furnaces should be capable of operation without the stack gases attaining a red heat. However, this result is not often attained. Assuming this red heat to be 900 degrees and the gas composition to be the same as in air furnace melting the sensible heat of the out-going gases is only 9/25 of that of the air furnace, counting from 0 degree Fahr. as a basis (which is not strictly correct). Therefore the heat value saved in the regenerators is 17/25 of that lost in the stack in air furnace practice. Using the heat loss in sensible heat of gases, leaving the air furnace as 7800 B.t.u. per pound of coal, and counting again from 0 degrees Fahr., the heat saved per pound of coal would be 5304 B.t.u. or over one-third the heat value of the fuel.

Quoting Campbell in *Manufacture and Properties of Structural Steel*, for a given sized chamber the escaping gases are a certain number of degrees hotter than the gases that go into it. If this difference is 300 degrees, then if the entering gas is 400 degrees, the escaping gases will be 700 degrees, and if the entering gases are 700 degrees the outgoing gases will be 1000 degrees. It will be seen that this reasoning implies that no change of economy results from changes of temperature in producer gas passing from the producer to the furnace. If no heat is lost in the gas while passing from the producer to the regenerator a loss corresponding to this saving is incurred in the outlet gases.

Since open-hearth furnaces are much less common in the malleable industry than air furnaces, correspondingly less is known of their design and operation. For general information on open-hearth operation the interested reader is referred to the literature of the subject regarding steel melting.

By kindness of Messrs. Lanihan and Fulton, the writer has been given access to a certain amount of data accumulated in the successful operation of open-hearth furnaces by the Fort Pitt Malleable Iron Co., Pittsburgh. Much of what follows is based on that practice supplemented where necessary by conclusions drawn from other sources.

Heat Balance of Open-Hearth Furnace

	B.t.u.	B.t.u.
Heat value of fuel	8,514,000	
Heat value of metal oxidized	294,000	
Heat formation of silicates (estimated)	36,000	
Total heat input	8,844,000	
Latent heat of fusion and sensible heat of metal		879,000
Sensible heat of flue gas		3,007,000
Loss due to uncomplete combustion of C to CO only		545,000
Sensible heat slag		51,000
Latent heat fusion slag estimated		36,000
Radiation conduction and stand by losses		4,326,000
Total heat output		8,844,000

Summary of Heat Balance of Open-Hearth Furnace

	Per cent	Per cent
Heat value of fuel	100.00	
Heat reactions in bath	3.86	
Totals	103.86	
Heat in metal		10.22
Heat in flue gas		35 33
Heat in slag		1.02
Incomplete combustion		6.41
Radiation and standby losses		50.88
		103.86

Malleable melting in the open hearth differs metallurgically in one very essential respect from steel melting. The steelmaker operates to greatly reduce the carbon and silicon content of the bath by oxidation. In malleable practice this oxidation must be kept down as much as practicable to insure control and reduce melting losses. Therefore the furnace atmosphere is subject to the same limitations as to composition as in air furnace practice. In view of the fact that this oxidation is actually kept down to about the same limits as in air furnace practice it seems reasonable in the absence of direct figures to assume that the CO, CO_2, O and N in the products of combustion should be about the same as is given in Chapter XII. An essential difference however will be the presence of a greater proportion of steam or water, since these furnaces are operated on natural gas and oil.

In the chapter on air furnace melting, the flue gas analysis was given as oxygen, 1.1; carbon dioxide, 12.7; carbon monoxide, 3.6; and nitrogen, 82.6 per cent. Assuming the gas in the present case to have this composition and assuming that the formula of the petroleum is $C_n H_{2n+2}$ the ratio of C to H in the fuel will vary from 3 to 1 to 6 to 1, depending on the molecular weight of the hydrocarbon being burned. We can calculate the flue gas per pounds of fuel closely.

Assuming a ratio of C to H of 5¼ (which probably is a little high but will compensate for the inaccuracy introduced by neglecting the carbon burned from the metal) we may conclude that one pound of fuel will require nearly 17.1 pounds of air for combustion, yielding 18.1 pounds of gas made up of the following amounts of the several constituents:

	Pounds
O	.152
CO_2	2.430
CO	.436
H_2O	1.322
N	13.76

If a gas analysis were made, the water would not be found, being condensed to a liquid in sampling for analysis. The composition by volume apparently would be:

	Per cent
O	0.8
CO_2	9.7
CO	2.8
N	86.7
Total	100.0

In the absence of actual analyses this may be taken as representing a near approach to the combustion conditions to be expected using oil fuel. The differences using gas fuel are probably insignificant as compared with the probable inaccuracies in some of the assumptions made.

The chemical changes occurring in the bath are identical in character and similar in magnitude to those occurring in the air furnace.

The oxidation losses in open-hearth melting have been investigated, in the light of the changes of composition during the process as determined at the Fort Pitt foundry. Typical results are given both in per cent of the original charge and in per cent of the original amount of the element present:

Loss in Open-Hearth Melting	Total charge 100 per cent	Amount of element 100 per cent
C	0.49	16.9
Si	0.29	22.9
Mn	0.154	40.5
P	0.00	0.0
S	—.004	—10.00
Fe	1.58	1.6
Total	2.51	

It will be noted that the oxidizing conditions are similar to those encountered in air furnace practice and described under that heading. The gain in sulphur and loss of carbon, silicon and manganese are less in open-hearth practice than in air furnace practice. However the oxidation of iron is sufficiently greater to keep the net loss at nearly the same figure as in air furnaces.

These conditions can be further followed by a consideration of the composition of open-hearth slag. A representative sample of this material had the following analysis:

	Per cent
FeO	37.6
Fe_2O_3	2.7
MnO	3.87
SiO_2	51.30
Al_2O_3	1.95
Undetermined	2.58
	100.00

The greater oxidation of iron as compared with manganese is evident. The decrease in Al_2O_3 also is apparent, since the refractory lining is largely silica instead of largely alumina as in fire brick structures. The silicon entering the slag from the metal corresponds to 12.1 per cent of the weight of the slag. Therefore, the slag consists of 56.27 per cent compounds derived from the oxidation of the charge and 43.73 per cent melted refractories.

Comparing the iron content of the slag with the iron oxidized we find that apparently about 101 pounds of slag, or 5.05 per cent of the weight of the metal are formed per ton charged and hence by calculation 44 pounds of refractories or 2.2 per cent are melted per ton of metal charged. These figures again are similar in order of magnitude to those determined by more exhaustive study on air furnaces.

Heat Balance Based on Assumed Data

The heat balance of an open-hearth can readily be calculated from a knowledge of the reactions occurring. Unfortunately we have not a complete record of tests involving all the factors to be considered. From the preceding assumptions and the fact that the average natural gas consumption of the furnace in question was about 8200 cubic feet per ton when regularly operated, the balance in Table I may be considered as an approximation, no claim to precision being warranted by the character of the data.

Expressing results in per cent of the heat value of fuel used and summarizing a little further the data may be expressed as in Table II.

In comparison with air furnace practice it will be noted that a general increase in economy is shown, 10.22 per cent of the heat of the fuel being effective instead of 7.81 per cent. The waste in sensible heat of flue gas and the loss due to incomplete combustion are decreased because, being gaseous or liquid, the fuel is all consumed and because hydrogen is present. Since the furnace constantly is kept hot, there is no perceptible heat loss due to sensible heat of furnace walls. However, there is a large loss due to the need of keeping some heat on the furnace during idle periods.

This loss, increasing with the idle time, makes 24-hour a day operation highly desirable. With such operation it seems that possibly 25 per cent of the present fuel could be saved. Radiation and conduction losses would still exist but stand by and sensible heat losses would be eliminated. Under such conditions an economy of about 14 per cent in the use of fuel might be reached as against about 8 per cent in air furnace practice in 24 hour operation.

Open-hearth furnace heats range in size from 14 to 20 tons or more, preferably at least two heats a day being made on a furnace. Fuel in the plant in question is natural gas or oil. The gas consumption varies from 8200 to 9100 cubic feet per ton.

Oil fuel runs from 43 to 62 gallons per ton. In both cases the results depend on whether or not the furnace operates continuously or intermittently and on the condition of the furnace.

For heats from 15 to 18 tons in size about 5 to 5½ hours are consumed in melting; 20-ton heats take around six hours.

The efficiency of design is largely dependent on the checker arrangement with its corresponding effect on the utilization of waste heat. Unlike an air furnace, the open-hearth requires

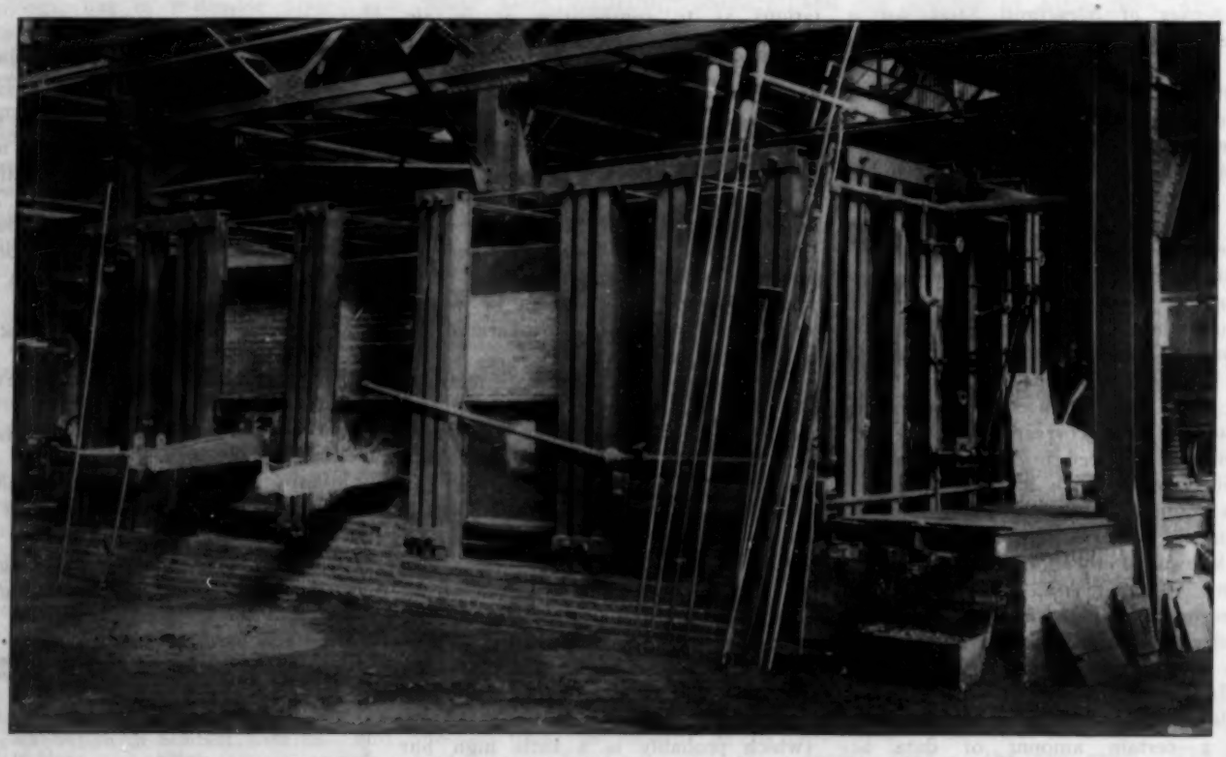


FIG. 1—POURING SIDE OF OPEN-HEARTH FURNACE FOR MALLEABLE IRON

FIG. 2—CHARGING SIDE OF OPEN-HEARTH IN MALLEABLE PLANT

rather infrequent but very extensive repairs. Furnace bottoms and banks are of course continuously watched and patched between heats. One furnace operated two years and two months, making 1282 heats with no repairs except cleaning the checkers and changing doors. The same furnace has since made 2051 heats with one cleaning of the checkers, a new roof, front, back and bridgewalls, an unusual record.

On the other hand another furnace, running on one heat a day and frequently cooled ran only 200 heats before extensive repairs were required, showing the extreme destruction from unequal expansion in heating and cooling of the brick.

The labor to operate an open hearth consists of either three or two and one half men per furnace. Charging is not included in this labor. The work of charging into a furnace through doors is prohibitively heavy and charging machines are almost a necessity.

No data as to the use of pulverized coal or producer gas are available for malleable melting, although both of these fuels are used in steelmaking with great success.

Smelting Iron Ore with Electricity

BY FRANK HODSON

IN THIS country only spasmodic attempts have been made to tackle properly the question of using white coal electricity for smelting iron ore. Many of these attempts have resulted in failure because they have been handled improperly. Inventors usually had a secret or special process to give him steel from iron ore in one operation and while such processes may have been possible, commercially they did not pay. A metallurgical engineer would have discarded these processes, and provided electricity was to be the source of heat used, referred them to a standard method for electrically converting iron ore to pig iron. Whether the pig iron should be allowed to cool or be taken when still molten and converted into steel, is a question of policy and utility that the metallurgist and the financial stockholder can decide. The sooner these direct processes for steelmaking from ore are forgotten and we get down to bedrock, which is cost of ore plus cost of fuel regardless of whether electric or other fuel is used, the sooner satisfactory progress will be made in this direction.

Generally speaking, it may be taken that where a market exists for either pig iron finished steel, in the presence of good iron ore with cheap water power, the electric smelting furnace has a scope. If it so happens, as is the case on the Pacific coast and in countries where iron is not made, that material used bears heavy freight charges, then the electric smelter is put on favorable terms.

At present, all electric smelting furnaces may be divided broadly into two groups; those using open top furnaces in which no attempt is made to make use of the escaping gases, and the Swedish electrometal type of furnace, in which the smelting is done in a closed chamber. The gases and products of combustion pass through a central shaft, through which the charge is fed down to the final reduction zone. The use of these gases assists materially in the quick reduction of the ore and of course is very economical as compared to an open top furnace. This type of furnace has been in successful commercial use in Sweden and Norway for the past ten years, and large plants with the electrometal smelter are now being constructed in Italy, Japan and Brazil.

Some of the furnaces at present constructed have a kilowatt capacity of 5800 kilowatts but in the writer's opinion improved design of furnaces will make it possible to have furnaces of this type of double present capacity. Interest is now being shown on the Pacific coast in electric smelting, and as an indication of the immense strides that have made in Europe in the last 10 years in this electric shaft furnace, the author would mention that a total of 27 furnaces installed have a rated capacity of 99,700 kilowatts.

Brazil is installing two furnaces of 3000 kilowatts each these being the first installations in the western hemisphere. Others are to follow the present installation. In this respect, Brazil is showing United States steel makers the vision ahead. In this connection, however, the U. S. Electric Steel Products Co. recently has announced its intention of building a large electric smelting plant on the Pacific coast where splendid opportunity exists for a properly designed and equipped plant.

The author, Frank Hodson, is president Electric Furnace Construction Co., Philadelphia.

Extracting Flue Dust Electrically

Principle Involved in Precipitating Dust by the Cottrell Process and the Method of Operating an Electrolytic Cleaner is Described—Comparison of Various Types of Gas Cleaning Equipment

BY N. H. GELLERT

CLEANING blast furnace gases never has been an easy problem to solve. Continual attempts at improvements have been made since the blast furnace was first put into operation, and have resulted in more efficient cleaning apparatus. Of interest to those engaged in the industry, is the method of attack and the adaptation of various processes of cleaning to blast furnace gases. In general, blast furnace gases contain from 2 to 10 grains of dust per cubic foot of gas at standard conditions of temperature and pressure, namely at 62 degrees Fahr. and 29.92 inches mercury which is atmospheric pressure. This dust exists in the form of both dust and fume. The fume is so finely subdivided, however, that in many respects, it acts as a perfect gas.

Any screen type of cleaner which attempts to filter out particles of dust and fume, even when the filtering medium is not destroyed by the normal heats of the blast furnace gas, must be sufficiently fine in nature to present a hole smaller than the finest particle of dust and fume going through in order to successfully remove the objectionable solid material in the gas. If the screen is so fine that it will remove the particles of fume, the back pressure will be high and the screen will clog up quickly. If the screen is designed with apertures large enough to prevent any considerable back pressure, the fine particles of fume and dust will go through. The problem, therefore, of screening the fume and dust out of the blast furnace gas is not easily solved.

Handling the Gases

In the manufacture of ferromanganese, the gases discharging from the furnaces have temperatures running as high as 1500 degrees Fahr. As steel glows red hot at temperatures of this kind, some necessity arises for cooling the gas to such a point that destruction of the steel does not take place. At the Dunbar and Sheridan, Pa. stacks where ferromanganese is made, the problem has been difficult. It has not been a question of whether the cleaner could operate or not at such temperatures, but whether steel could maintain its strength or not under such conditions of stress. The strength of steel drops rapidly with the increase of temperature, until at about 1500 degrees the strength is less than one-quarter of the original strength. Some means must be devised to cool the gases to such a point that they may be passed safely through the cleaner. This problem is not at all present in furnaces manufacturing pig iron as the temperatures rarely run over 400 to 500 degrees, and even in exceptional cases, rarely over 700 to 900 degrees and steel can be made to stand this strain.

With the hotter gases, however, it is necessary to design coolers that will function without the addition of moisture to the gases. If it is desirable to cool the gas which is as high as 1300 degrees Fahr. to a temperature

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Abstract of a paper presented recently before the Cleveland section of the Association of Iron & Steel Electrical Engineers. The author is president of the Gellert Engineering Co., Philadelphia.

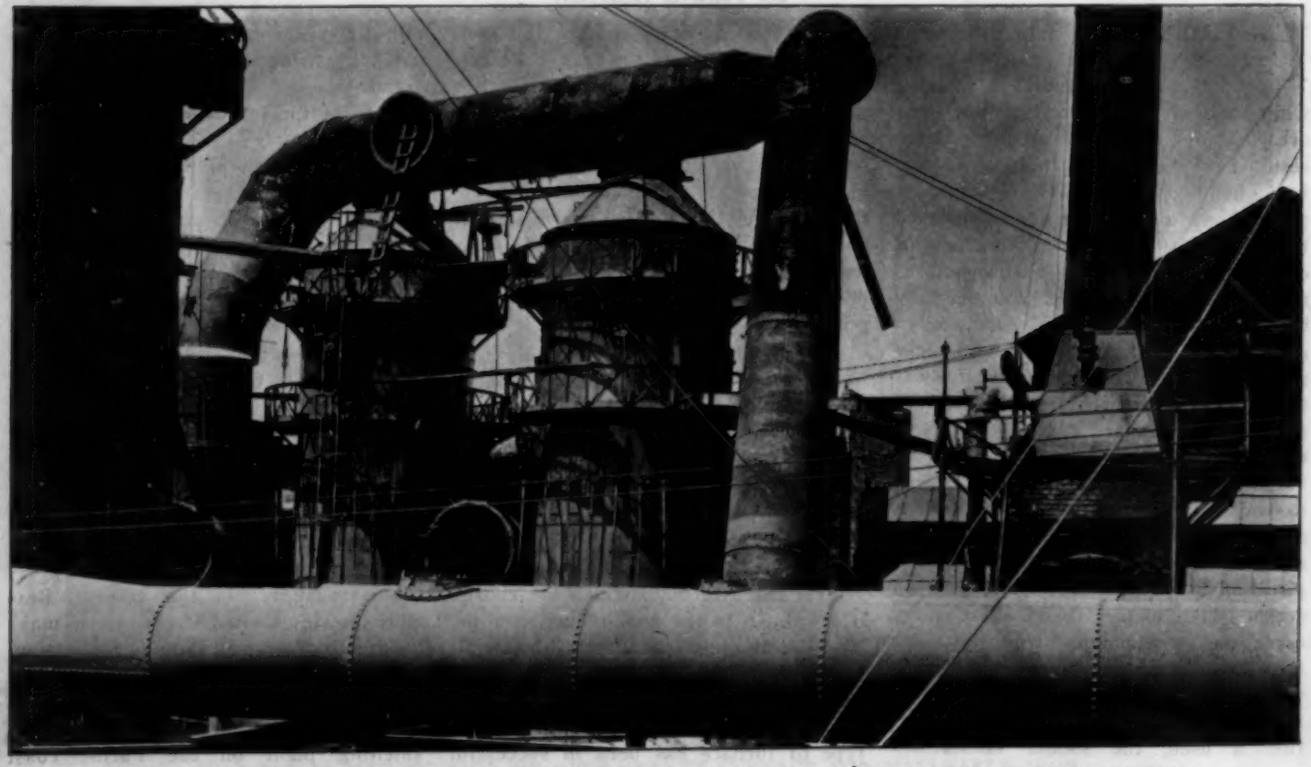


FIG. 1—GENERAL VIEW OF COTTRELL TYPE PRECIPITATORS DURING THE COURSE OF CONSTRUCTION

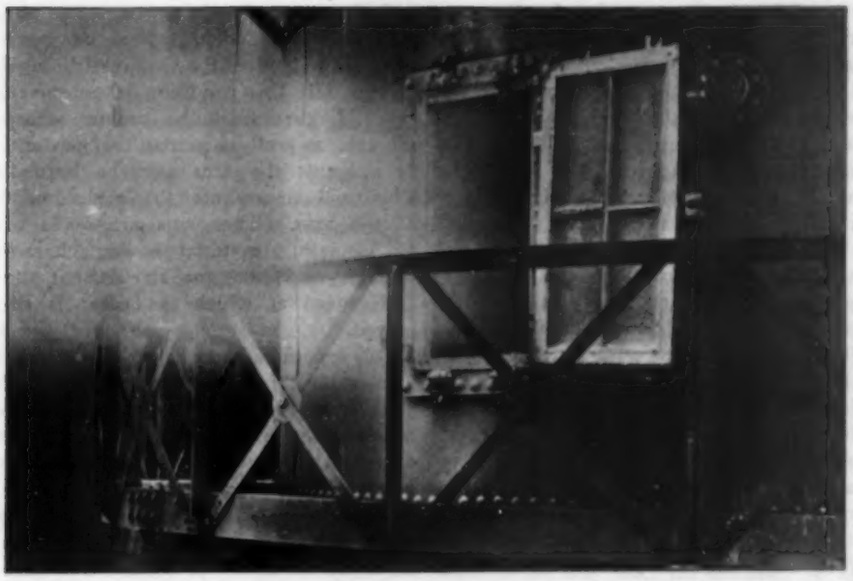


FIG. 2—PARTICLES OF FUME ISSUING FROM PRECIPITATOR. CURRENT OFF

between 400 and 500 degrees so as not to lose the sensible heat, which is present in the gas at this lower temperature, care must be taken not to add water for cooling purposes as the amount of water present when the gas is saturated at 400 degrees is so great that it would seriously handicap combustion in the stoves and boilers. A cooler, therefore, must be of such a type that the heat is transferred from the gas into the water through tubes and not by direct contact.

Principle of Electrical Gas Cleaning

The electrical cleaning of gases, as developed several years ago by Dr. F. G. Cottrell, is a process which makes use of a few fundamental facts in physics. The results obtained in the electrical precipitation of impurities from blast furnace gas were presented on page 448 of the Feb. 13, 1919 issue of THE IRON TRADE REVIEW. The principle involved is not difficult and can be understood by conceiving of a gas passing through an invisible electrical screen so fine that the finest particle of fume cannot pass through, yet occupying no space, having no material body and consequently presenting no source for back pressure. It is by means of this electrical screen interposed between the outlet of the furnace and the inlet to the hot stoves and boilers that blast furnace gas may be cleaned of its dust and fume content to a degree finer than any mechanical screen can clean it without the considerable loss of back pressure.

The reason for this is that the electrical screen is not woven of wires, but is woven of lines of electrical force. The threads of force constituting the screen are knit together so closely that a substance must drop below its molecular form to get through when conditions are correct for the screen to operate. Yet, these lines of force, having no material body, do not interrupt the flow of gas on which they have no effect whatever.

The gas is conducted through a vertical pipe, entering from the bottom and issuing at the top. An electrode chain or wire is suspended vertically in the exact center of the pipe. It is held taut by a weight at the bottom. This electrode is charged with high tension unidirectional current. It, therefore, must be suspended on the proper insulators, which are capable of withstanding the potential under which they are impressed. The pipe itself is grounded. When the dirty gas passes through the pipe and comes in contact with the charged electrode, it becomes ionized. As the electrode is charged negatively and has a corona discharge due to the high potential impressed upon it, the ionization of the gas is rapid and thorough.

Activity of Internal Forces

The gas molecules carry the charge to the dust particles which for the most part are electrified negatively since the electrons prevail in the gas. Immediately upon being charged, the dust and fume particles are repelled by the electrode and are deposited on the sides of the pipe which interrupt their flight from the chain. Within the pipe are three forces in action, namely, a vertical force due to the velocity of the gas which is carrying the dust and fume particles upward, the force of gravity which tends to carry the dust particles downward; and the force caused by the charging of the dust particles through the ionization of the gas. The latter is a horizontal force, inasmuch as the action of the repelling of the particle from the chain is at right angles to the chain.

The resultant of these two forces is a diagonal of a parallelogram, having both these forces as sides. If the vertical force is too heavy for the particular pipe described, the horizontal force may not be sufficient to cause a resultant that would precipitate the particles of dust to the sides of the pipe. While the particle of dust would be acted upon by the horizontal force, the resultant might be such that the particle would not travel to the side of the pipe within its length.

The problem, therefore, in electrical precipitation is to regulate the vertical force so that it is not too heavy and to regulate the horizontal force so that it is sufficiently great to form a resultant which will precipitate the particle of dust to the side of the pipe. The principle is not simply one of

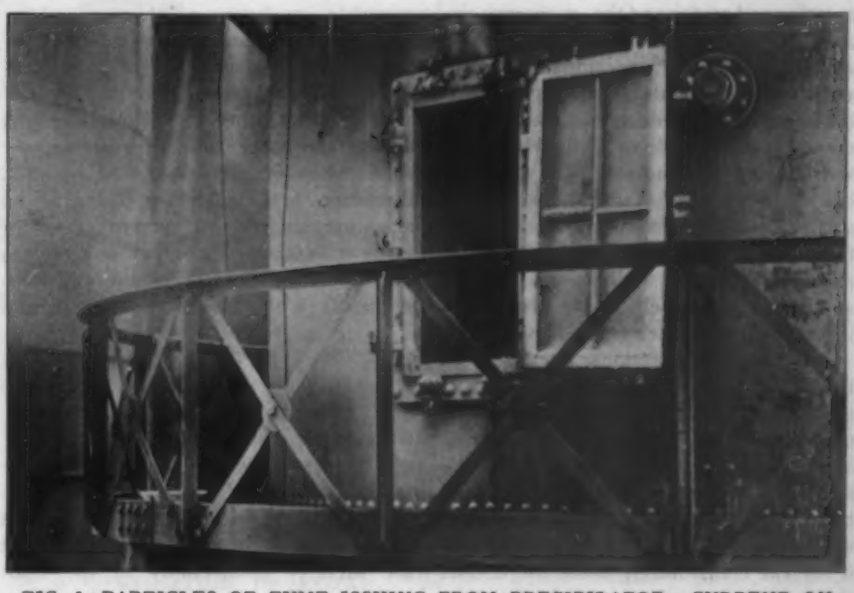


FIG. 3—PARTICLES OF FUME ISSUING FROM PRECIPITATOR. CURRENT ON

ionization and is not one of magnetism. The particle of dust does not stick to the side of the pipe because of the magnetism caused by the corona discharge and gas flow. The dust particle sticks to the side of the pipe because it is held there fast by the resultant electrostatic force that is acting upon it throughout the entire period of operation. It is as though an arm had extended diagonally from a point on the electrode and pinned the particle of dust to the side of the pipe with a finger and were holding it there without letting go.

Factors Governing the Forces

The control of the vertical force is of course, made in the design of sufficient cross sectional area in a precipitator to give what has been found to be the best velocity of the gas for precipitation purposes. To get the horizontal force necessary for precipitation is a question of design of electrical equipment. The voltage that can be impressed on the electrode is limited by the gap between the side of the pipe and the electrode. This has led erroneously to the assumption that the bigger the pipe and the higher the voltage that may be impressed, the stronger the force that may be secured to act horizontally. This is questionable because the force varies inversely as the square of the distance between the object to be precipitated and the electrode, so that even with higher voltage, the impressed force on the particles may be less than with lower voltage.

To develop the current which will do the work it is necessary to do in an electrical cleaner, certain electrical apparatus have been developed specially. These are divided into units. One consists of a switchboard, transformer, rectifier and motor and the necessary insulators and conductors for getting current into the precipitator. The switchboard consists of a special panel having a circuit breaker, ammeter, voltmeter, double throw, double pole switch, set of sockets for voltmeter blocks, three pole starting switch, and a five point transformer switch. In the back of the panel are the starting rheostats for the synchronous motor, and below the panel are the resistances in series with the transformer.

All panel connections are of low tension. All the high tension connections are inside a steel guard work to prevent the operator from coming in contact with the high tension equipment. The circuit breaker is used to break the transformer primary circuit when the voltage exceeds a safe limit for the transformer, while the double throw switch underneath the instruments is used to cut in the line on the right polarity. The five point switch is used for the purpose of obtaining a different transformer ratio without leaving the operating position at the switchboard and without the necessity of going into the high tension room to make any changes in ratio.

All electrical equipment is built to special specification and is so carefully put together that in operating both plants now in existence for the cleaning of blast furnace gases, no electrical difficulty has been experienced excepting the sort that would normally occur in running electrical apparatus. The synchronous motor operates much as any synchronous motor would under conditions of load. The rectifier consists of a rotor and a stator, the former revolving in direct unison with the synchronous motor as the motor is directly connected, by means of a coupling, to the rectifier. Since the four pole synchronous motor, running on 600 cycles, revolves at 1800 revolutions per minute, and since there are 3600 cycles in each minute, there are two cycles of alternating current to every revolution of the motor and, consequently, of the rectifier.

The rotor and stator each consist of four arms, the rotor having four brass copper tips and the stator having four shoes. Consequently, the rotor arms have four positions in which each one of these is opposite the stator shoe. These four positions correspond to the four alternations passed through during every revolution, two positive and two negative. Each two adjacent rotor arms are connected by means of a fine copper wire so that there are two pairs of rotor arms. Consequently, the wire connections will be in four different positions during a complete revolution of the rotor. During the operation with one pair of these positions, one side of the transformer is connected to the ground shoe and the other to the rectifier and during the other pair of positions, the connections are reversed. The rectifier, therefore, acts much the same as an armature on a direct current generator since it is acting in synchronism with the revolutions of the motor and consequently with the alternating current.

Design of Rectifier is Important

It is always desirable to apply negative current to the precipitator, transformer and rectifier, if the polarity is right. By this apparatus unidirectional current is obtained at the precipitator. Naturally, the rectifier must be built carefully and so designed that the metallic connections to the shaft and the distance between the shoes and the rotor tips is greater than the maximum distance at which the spark will jump under the impressed high voltage. If this condition is not taken care of, there will be arcing across the arm as well as across the gap and as a result the arm may be burned. This will necessitate the replacement of the arm. The arms are made of an insulating material having characteristics necessary for strength at the high speed at which the rotor is revolved.

Of especial interest is the transformer built for precipitation purposes. This transformer is compact although considerably larger for the same power output than transformers used on lower voltages. The low tension coils usually are wound of rectangular cross section copper wire covered with a double layer of cotton. If these coils are wound for several voltages, as they are for precipitation transformers, two layers of windings are made with the taps distributed along the middle length of the outer layer. Transformers to be used for blast furnace precipitation are equipped with five taps. The insulation between the high tension and low tension circuits consists of a black varnished material similar to cambric and usually is wrapped to nearly ¼-inch thickness. The high tension coils then are assembled in specified order with the proper insulation over the low tension coils or in some designs beside them, after they have been independently wound and insulated.

High Tension Coils

This portion of the transformer has engaged possibly the most serious and careful attention of the designer. The service represented by the Cottrell precipitator with a mechanical rectifier in circuit is the most severe which can be imposed upon a transformer. About 18 separate coils in the high tension winding of the usual sized transformers are required. These may be divided into the buffer or end coils; the intermediate group; and, the main winding proper.

The buffer or end coils are supposed to receive the most severe electrical strains. Undoubtedly, they do receive the extreme efforts due to a steep electrical wave front impinging on the transformer windings and accordingly they are insulated with extremely heavy insulation between turns. The outside coils consist of a single turn per layer that is the conductor is wound on itself in a single continuous spiral increasing in diameter with each turn by the thickness of the insulated conductors, there being perhaps 15 to 20 turns in both end coils. In the second buffer coil, because of the lighter ribbon size and thinner insulation, there

are perhaps 30 to 40 turns in each section or half coil.

As stated previously, these buffer coils receive the direct effect of the incoming steep wave front of a surge or oscillation. This energy surge penetrates the winding a certain distance and in so doing, a transformer action between these turns and the adjacent windings is set up, so that it is possible particularly in the case of sustained arcing or standing waves in the circuit, to have extremely high induced potentials in the coils adjacent to the buffer coils. Accordingly, the "intermediate" coils which are wound with round conductors similarly to the main winding, are given especial insulation between turns and between layers to withstand this high induced potential.

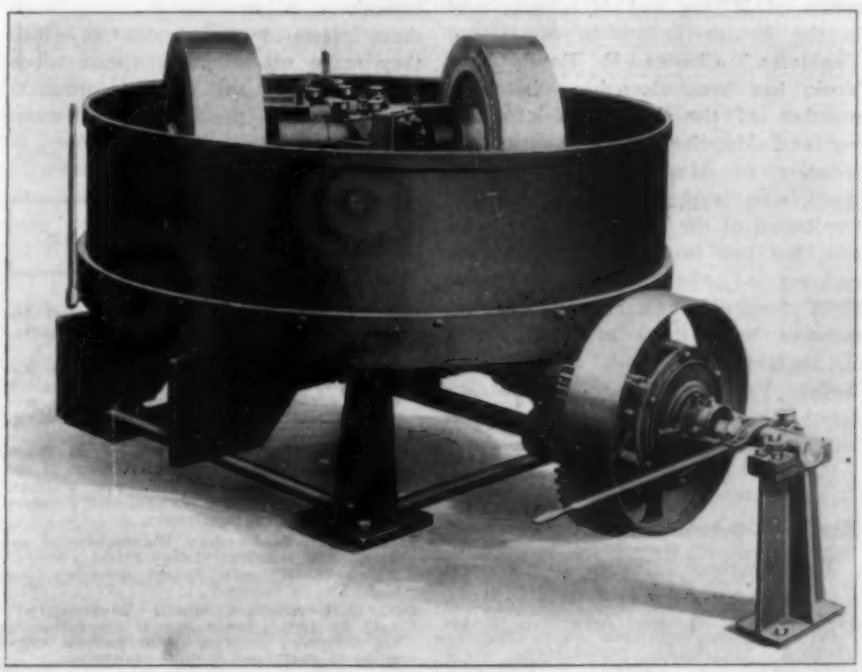
Magnetic Action Is High

The magnetic forces existent in a transformer with a large power system behind it at times of short circuit often exceed several tons per linear foot of exposed coil periphery. It is apparent that the circular coil construction is ideal from the standpoint both of mechanical forces and ease of insulation. Both low-tension and high-tension windings are cylindrical and there is no tendency toward distortion of shape in either winding.

All the electrical equipment is housed in a small building in which the entire electrical operation takes place. The precipitator consists of a number of pipes in a shell with electrode chains hung in each one of the pipes. The precipitator may be set up singly or in multiples depending on the size of the installation. For a small plant one precipitator is needed and for a large plant a number of precipitators are necessary. These precipitators are all of the same size, however, and the capacity of the plant is increased by increasing the number of precipitator units, and likewise the number of electrical units.

Gas is fed to the precipitator under the header plate and leaves the precipitator above the header plate. In order to get into the upper chamber, the gas must circulate around the pipes downward, then go up through the pipes into the electrical field before it can make its escape. As gas leaves the precipitator in a cleaned state, it is distributed to the boilers and hot stoves as required. After the dirty gas has filled the precipitator and is making its way out, the rectifier is started by throwing in the synchronous motor switch and the circuit breaker is closed. The five tap switch is adjusted so that the proper tap on the transformer is put into service and the double throw switch is then closed. If considerable arcing takes place, and only a low primary voltage can be carried, it usually is evident that the wrong polarity is being applied. The double throw switch is then pulled out and thrown to the other contacts. If the right polarity is then impressed, the voltage will stay up and arcing will be absent. Clean up then takes place.

The results obtained both at Sheridan and at Dunbar have been satisfactory, at Sheridan, particularly. The precipitator there has been operating continuously and collecting approximately 5000 pounds of dust per day from approximately one-half of the gas output of a 250 ton furnace. This dust is extremely fine in nature and ignites on exposure to air. It has been impossible to determine the fineness of the dust as it sinters as soon as it is dumped and screen tests taken after the dust has cooled off do not indicate the condition of the dust as collected.



RAPID SAND MIXING IS ACCOMPLISHED BY A COMBINATION OF PLOWS AND MULLERS

CROSS SECTION OF NEW PUMP SHOWING PACKING GLAND

Uses New Packing Gland on Rotary Pump

Centrifugal and rotating types of pumps manufactured by the Arrow Pump Co., Detroit, are equipped with a new design of packing gland which functions on the ring oiling principle. This construction it is claimed, eliminates pump troubles such as leaky glands, scored shafts and short life of these parts due to improper lubrication at the glands. The accompanying illustration in cross section shows in detail the new method of construction. The packing gland is so arranged in combination with an adjustment nut and oil reservoir as to permit using the ring oiling principle. In this manner, a constant and positive flow of oil is supplied to the gland thereby practically converting it to a bearing supporting the shaft close up to the load. Deflection of the shaft is prevented thus the seal of the packing remains undisturbed and will retain the seal for long periods without adjustment.

Builds Large Sand Mixer

For mixing large quantities of sand for use in steel foundries as well as large capacity gray iron, malleable, brass and aluminum foundries, the National Engineering Co., Chicago, has designed a sand mixing machine with an 8-foot diameter pan. This mixer, shown in the accompanying

illustration, is adaptable to mixing facing and core sand and other foundry sand mixtures as well as for preparing daubing to line cupolas and furnaces. Through the mixing action accomplished by a combination of plows and mullers, the machine has a large capacity and a quick mixing action.

Board Analyzes Ferroalloy Tariff Situation

Conditions affecting the ferroalloys industries in the United States which were taken into consideration by the ways and means committee of the house in drafting the Fordney tariff bill are set forth in a report issued recently by the tariff commission. After making a survey of the industries, the commission states that the following are "subject to considerable active foreign competition:" Ferromanganese, electric-furnace ferrosilicon, ferrochrome and ferrotungsten. It classifies the following "subject to little or no foreign competition." Spiegeleisen, blast-furnace ferrosilicon, ferrovanadium, ferromolybdenum, ferrotitanium and ferrophosphorus. With regard to the source of the raw material, or ore concentrate, the commission divides the ferroalloys into two groups: Those dependent wholly or mainly on domestic ores or materials, and those dependent wholly or mainly on foreign ores or materials. In the first group it includes spiegeleisen, ferrosilicon, ferromolybdenum, ferrotitanium and ferrophosphorus; while in the latter group are ferromanganese, ferrochrome, ferrotungsten and ferrovanadium.

"Some domestic ores are used in the production of ferromanganese and ferrotungsten, but these ores are either limited in amount or produced at considerably greater expense than the foreign material," the commission reports. "Ocean freight rates do not seem to affect the prices to American manufacturers, of tungsten-bearing ores and probably chromite, but the foreign exchange situation affects both of these and also manganese ores. The control of vanadium ores by American interests having their furnaces in this country precludes any present question of the ability of the domestic producer to hold his own market."

The commission's grouping of the ferroalloys according to the process of manufacture most commonly used is as follows: Blast furnace method—spiegeleisen, ferromanganese, bessemer ferrosilicon (silicon content 8 to 15 per cent) and ferrophosphorus. Electric furnace method—Ferrosilicon with silicon content 16 per cent and above, ferrochrome, ferrotungsten, ferrovanadium, and ferrotitanium.

"The competitive position of the American producer depends mainly upon two things, the cost of raw material and the price of electric power," the commission states. "To these two factors may be added labor cost, although this item is a smaller factor than the two foregoing. In a period of severe competition it might be a decisive influence in the case of a few of the electric furnace ferroalloys, such as ferrosilicon and ferrochrome. In the case of the blast furnace ferroalloys, the higher wages in this country compared with those prevailing in Europe are offset by larger furnaces and greater output per man. Where the ore costs are low the item of labor becomes relatively more important and thus more of a determining element. Under present conditions labor cost is not a large enough item in the high priced alloys to be a big factor. Excepting the iron-manganese alloys and bessemer ferrosilicon the great bulk of the ferroalloys produced in the United States at present are made in electric furnaces. The largest item in the conversion of ferroalloys is the price paid for electric power."

The commission gives an analysis of conversion costs pertaining to electric power as they existed in 1919, its statistics not being carried beyond that year. In that year the production of electricity in the United States amounted to 38,900,000,000 kilowatt hours, distributed with reference to source as follows: Water power, 14,740,000,000 kilowatt hours; fuel power, 24,160,000,000. The country is well endowed with water power.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

CABLE messages from abroad indicate that more foreign honors have been conferred upon American engineers who are in Europe for the purpose of awarding the 1921 and 1922 John Fritz medals. Ambrose Swasey, Warner & Swasey Co., Cleveland, sponsor of the Engineering Foundation and past president of the American Society of Mechanical Engineers, has been elected to honorary membership in the British Institution of Mechanical Engineers, British Institution of Mining and Metallurgy and in the British Institution of Mining Engineers. Charles F. Rand, New York, has been elected an honorary member of the Institution of Mining and Metallurgy, and of the Institution of Mining Engineers. Mr. Rand, who is chairman of the executive board of the Engineering Foundation, has just been made an honorary member of the British Iron and Steel Institute. Other elections announced were those of Col. Arthur S. Dwight, New York and William Kelly, Vulcan, Mich., to honorary membership in the Institution of Mining Engineers.

* * *

Engineers Submit Standards

The American Institute of Electrical Engineers has submitted its standards, 1921 edition, to the American Engineering Standards committee, New York, for approval as an American standard. The standards are submitted in accordance with the special provision in the procedure of the committee under which important standards adopted or in process prior to 1920 may be approved without going through the regular process followed in new work. The standards submitted represent the latest revision of the American Institute of Electrical Engineers standardization rules, revised during 1919 and 1920. The first edition of the rules was issued in 1899. The American Engineering Standards committee is anxious to learn from those interested of the extent to which they make use of these specifications and to receive any other information regarding the specifications in meeting the needs of the industry.

Convention Calendar

Sept. 12—National Exposition of Chemical Industries, in the Eighth Coast Artillery armory, New York.

Sept. 14-16—National Association of Cost Accountants, will hold its annual convention at the Cleveland hotel, Cleveland. The secretary's address is 233 Woolworth building, New York.

Sept. 19-24—American Society for Steel Treating. Annual convention and exhibition at the Manufacturers building, state fair grounds, Indianapolis. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Sept. 29-Oct. 1—American Electrochemical society, fall meeting, Lake Placid, N. Y. Joseph W. Richards, Lehigh university, Lehigh, Pa., is secretary.

Oct. 17-22—American Mining Congress, will hold its twenty-fourth annual convention in the Coliseum, Chicago. Also national exposition of mines and mining equipment.

Dec. 1-3—Taylor society, fall meeting, New York. Harlow S. Pearson, 29 West Thirty-ninth street, New York, is secretary.

May Advance Roads $500,000,000

Government Officials Feel Anticipation of Settlement with Carriers, Will Stimulate Business of Railroads and of Whole Nation—Reduction of Surplus Cars Indicates Repair Work Being Carried and Loadings About Stationary

WASHINGTON, July 12.—Secretaries Mellon and Hoover are now bending their efforts toward making available to the railroads between now and Jan. 1 a sum estimated in round numbers at $500,000,000. This advance is to be made in anticipation of settlement of all of the claims between the railroads and the federal government and is expected to put the carriers in position to re-enter the labor and materials market. Secretary Hoover has voiced the belief that since the carriers directly and through railway supply houses account for 20 per cent of the labor and 20 per cent of the materials of the country, the government will endeavor to be fair, financially, with the railroads and ease not only their situation but also general business conditions.

Claims of the carriers against the government and counter claims fall into three classes. First, the roads are contending for $875,000,000 because of "inefficient" labor in the control period, this sum being claimed over and above all other allowances. Second, the sums due the roads for the guarantee period, March 1 to Sept. 1, 1920, after the government relinquished control of this, some $600,000,000 was due, of which more than half has been paid and partial payments are liquidating the remainder. Third, the capital account expenditures of the government upon the carriers in the control period. In return for the equipment purchased by the government the roads have already turned over to the treasury some $310,000,000 in equipment trust certificates. Other capital account expenditures approximating $750,000,000 are now in process of negotiation, and it is around these that the contemplated advance of $500,000,000 hinges. Secretary Mellon has practically announced that the government will advance this half billion in cash and in turn take 6 per cent bonds payable 1 to 10 years.

Would Aid Car Repairs

This will go a long way toward rehabilitating the finances of the carriers, secretary Hoover believes, and make them buyers once more. Broadly speaking, the sum would be used largely for cancelling the railroads' obligations to supply houses and for repairing bad order equipment. On June 15 bad order equipment of all the railroads of the United States was 15.1 per cent of the total owned, or about 353,340 freight cars. On Jan. 1 the percentage of bad-order cars was 8.5, and on March 1, 1920, when government control ended, 6.7. Five per cent is the aim of the railroads in normal times. The freight cars now owned by the roads number about 2,343,000. Were the carriers enabled to begin repairing the 353,340 bad order freight cars the call for labor and material would go far towards dispelling the present industrial stagnation, Secretary Hoover is positive.

That some work is being done on the bad order cars is evidenced by the continued decrease in the number of freight cars declared surplus. By the end of June the surplus had been cut down to a daily average of 373,791, while at the beginning of April the surplus cars topped 507,000. There has not been one week since April 1 in which the surplus has failed to recede. Freight loading, in the meantime, seems unable to thrust itself above 780,000 cars a week. In the week ended June 25 loading amounted to 775,061 carloads, a decrease of more than 5000 for the week. At the corresponding period of 1920 the roads were loading 911,503 carloads weekly. In the week ended June 25 loading of coal dropped to 156,999 cars, coke to 4557 and ore to 28,921.

The bureau of statistics of the interstate commerce commission has given out the following statistics on revenue freight carried by Class I railroads, those having annual operating revenues above $1,000,000, in the first quarter of this year.

	No. of carloads	No. of net tons
Iron ore	80,133	4,367,582
Coke	174,917	6,316,630
Iron, pig and blooms	66,266	3,063,948
Rails and fastenings	43,548	1,816,830
Bar and sheet iron, structural iron and iron pipe	288,613	9,967,287
Other metals, pig, bar and sheet	47,085	1,701,590
Castings machinery and boilers	123,630	2 513,947
Agricultural implements	69,567	1,134,735
Autos and trucks	133,525	1,047,397

The Donner Steel Co., Buffalo, has appealed to the District of Columbia supreme court for a writ of certiorari in order to transfer its case against all of the railroads serving Buffalo. The Donner company asked the interstate commerce commission to award $500,000 reparation from the roads, alleging it was put to this expense "spotting" cars when like service was rendered its competitors. The commission decided in favor of the railroads and now the Donner company is appealing to the courts.

The commission has ruled, in the case of the Empire Steel & Iron Co. against the Central Railroad of New Jersey, that the maintenance by the latter or junction point rates on coal to points on the Morristown & Erie railroad while contemporaneouly refusing to maintain such rates on the Mount Hope Mineral railroad is not unduly prejudicial. This is a reversal of the original decision. The Mount Hope is a subsidiary of the Empire Steel & Iron Co.

Employment Decreases 2.9 Per Cent in Month

Washington, July 12.—Employment in the iron and steel industry receded 5.7 per cent in June and in metals and metal products other than iron and steel 2.2 per cent, according to the June survey of the United States employment service. For the entire country, the decrease in employment on June 30 as compared with May 31 is estimated as 2.9 per cent. Of the 14 industries surveyed in June, eight reported decreased employment, and of the 65 cities covered, 39 reported decreases. The automotive industry is now back in the adverse column, along with iron and steel, chemicals, lumber, paper and printing, railroad repair shops and miscellaneous.

"Industry generally is optimistic and while the likelihood of a dull summer in most lines is fully recognized the tendency is to count on improvement by fall and a healthy though not spectacular business revival by the spring of 1922," the service comments.

Among the 26 cities reporting increased employment for June are Atlanta, with 16.7 per cent increase; Toledo, O., 15.6; Denver, 4.6; Springfield, Mass., 2.8; Worcester, Mass., 0.9; and New Bedford, Mass., 0.8. The 39 cities reporting decreased employment included Cleveland, 12.6 per cent; Indianapolis, 9.6; Columbus, O., 7.7; Baltimore, 7.3; Pittsburgh, 5.2; Chicago, 4.9; Detroit, 4.8; Buffalo, 4.5; Cincinnati, 4.3; Boston, 3.6; Minneapolis, 3.3; Johnstown, Pa., 3.5; Milwaukee, 2.9; Philadelphia, 0.9; and Youngstown, O., 0.5.

Rail Financing Plan Important

Government's Tentative Arrangement To Extend $500,000,000 to Roads May Help Unravel the Tangled Skein of Congested Credits—Outlook for Railroad Buying Improved—Financial Sentiment Approves Steel Cuts—Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

THE reduction of steel prices and wages and the evidence from Washington that the railroads are to be given financial relief, easily take rank as the most important constructive developments of recent weeks. Each has a bearing both upon the steel industry and upon general business as well. Tentative plans have been completed whereby the government is to fund obligations due it from the railroads and at the same time to release about $500,000,000 from the treasury to the roads.

Providing the plan goes through in accordance with expectations its significance for the financial and business situation will be twofold. It will provide a powerful stimulus for the thawing of "frozen" credits and it will improve the financial standing of the railroads to such an extent that essential buying will be hastened.

One of the most serious problems connected with the existing depression is that of "frozen credits". Vast sums of credit are tied up in loans on unmoved commodities. In addition still other large amounts are held in the vise, the result of inability of commercial customers to meet their bills long due.

Step Would Stimulate Business

This latter condition is true of the railroads. A large part of the funds they may receive from the government will be needed to pay their bills for equipment and other materials. It is estimated that liquidation of current bills by the railroads would inaugurate a "thawing out" process which would work back into many channels of trade and result in releasing several billions of dollars. The effect of this upon the entire business situation would be stimulating. All this would be in addition to the immediate effect of new railroad buying of steel for equipment. That the roads are expecting to buy to some extent is evident from current trade reports from many sources. Even the paint manufacturers report that more inquiries have been received from the railroads in the last few weeks than for many months previously. There is no thought that the railroad outlook will cause the country to swing into a full stride of business recovery. The most that can be hoped for it, is that it may mark the turning point from the bottom of the depression now being witnessed. The journey to normal conditions is a long one, but sentiment will be cheered by evidence that the start has once been made.

The railroad situation justifies a more optimistic outlook for other reasons. While earnings are still only about 29 per cent of the total needed to give the systems the 6 per cent return contemplated in the transportation act, the roads have shown their ability to increase their net in the face of lower gross returns. This has been done by economies of many kinds, chief of which has been the cutting of payrolls. The wage reduction of 12 per cent effective July 1 will further increase net earnings, which in May showed an increase for the class 1 roads of more than $7,000,000 over April. Moreover it is important to remember that the late summer and fall months of the year are always the golden ones for the roads.

Financial opinion has approved the steel industry's price cuts. In some quarters it is believed that conditions will compel still lower prices, while in others it is felt that rock-bottom levels have been reached on the basis of present wage and railroad freight costs. The future of the steel prices, like those of other commodities, will be determined by such economic factors as demand, ability to buy, and the general trend of costs and prices in other lines. Steel prices may go to a point much further below production cost than now, but only temporarily. Curtailed production and essential consumption will supply the remedy.

Steel cannot be made for long at a loss. It is a constructive indication, however, that producers are willing to accept a temporary loss in order to contribute their share toward getting down to a normal basis upon which business may be done at a profit. The action of producers is of far-reaching importance also in that it paves the way for lower wage costs.

The government's report of the country's crop prospects as of July 1 offers another sign of encouragement in the outlook. With a corn crop of 3,123,000,000 bushels, only slightly less than the record crop in 1920 and with an estimated wheat crop of 809,000,000 compared with an actual yield of 789,000,000 bushels one year ago, the farmers apparently will have an opportunity to recoup their purchasing power this year in part at least. The crops are being produced at about 40 per cent of 1920 cost it is estimated. In the meantime the prices of manufactured commodities are steadily falling to within reach of a common level with farm products.

During June the weighted index number of wholesale commodity prices compiled by R. G. Dun & Co., showed a decline of 3.1 per cent to 132 per cent about the prewar level. In contrast with this decline, Bradstreet's index for July 1 showed the first increase since the depression started last year. It is significant that the increase of 1 per cent was largely caused by advances in prices of foods. This index is made up of raw materials prices fluctuations of which are always in advance and more pronounced than those of finished goods or retail prices. The action of raw material prices last month may forecast a greater stabilization of all prices some months hence. Indeed many signs point to this development.

Says Railroad Buying To Develop Soon

The needs of the country will make imperative in the near future the resumption of equipment buying by the railroads on large scale in the view of President W. H. Woodin of the American Car & Foundry Co. In his statement to stockholders contained in the company's annual report for the fiscal year ended April, President Woodin reviewed the industrial situation and outlook.

A backward step will be taken if the railroads are deprived now of the increase of freight rates recently granted them. This should not be attempted, he believes, until after a fair trial has been given the conditions brought about by the increase in rates and the reduction in operating costs. President Woodin predicts severe competition from European manufacturers in world trade. He doubts if the problems of financing export markets for Americans can be solved without

government aid. Going further he says:

"That from time to time a greater or less number of cars stand idle does not argue that the roads have all the equipment needed. It happens at the present time and due to general business depression that there is a dearth of traffic to be moved. Notwithstanding this, the ratio of cars now idle to the total available for service is inconsiderable—and as soon as conditions once more approximate the normal the lack of equipment will be very much in evidence. While, therefore, this company in common with like industries confronts the likelihood of a lessening of its activities for some time to come, nevertheless this can be faced with equanimity in the certainty that buying must start soon. The manufacture and sales of the company's miscellaneous products has yielded a greater volume of business than has the car repairing."

The total profits of the company for the last year, after federal taxes, aggregated $13,212,816 as compared with $14,382,565 in the previous year. After dividends a balance of $2,850,856 remained to be added to surplus, which increased that item to $35,276,568 as of April 30 last.

The following table gives the company's income account in detail as compared with the year before:

	1921	1920
*Total profits	$13,212,816	$14,382,565
Rentals, repairs, etc.	4,661,960	3,981,373
Net	$8,550,856	$10,401,192
Preferred dividends	2,100,000	2,100,000
Balance	$6,450,856	$8,301,192
Common dividends	3,600,000	3,600,000
Balance	$2,850,856	$4,701,192
Add. to res. com. divs.	.....	3,600,000
Surplus	$ 2,850,856	$ 1,101,192
Previous surplus	32,425,712	31,324,520
Total surplus	$35,276,568	$32,425,712

*After provision for federal taxes.

Corporation Tax Returns Are Due July 31

Blank forms for filing capital stock tax returns returnable by July 31 have been sent by collectors of internal revenue to corporations which filed returns for the preceding year. The capital stock tax is a special excise tax imposed on corporations with respect to "carrying on or doing business." The tax on domestic corporations is $1 for each $1000 or so much of the fair average value of its capital stock for the preceding year ending June 30 as is in excess of $5000.

Foreign corporations are required to pay a tax at the rate of $1 for each $1000 of their capital employed in the transaction of business in the United States without the benefit of the $5000 deduction. The tax is payable in advance, returns filed in July of this year covering the taxable year beginning July 1, 1921 and ending June 30, 1922.

The bureau estimates that approximately 325,000 such returns will be filed and that the amount of revenue collected from this source will be approximately $90,000,000.

Returns are required of every domestic corporation regardless of the par value of its capital stock and of every foreign corporation irrespective of the amount of capital employed in this country in the transaction of its business. Corporations claiming exemption are required to file returns setting forth their reasons for such claims, accompanied by evidence in support thereof.

Dominion Steel Shows Large Earnings

The annual report of the Dominion Steel Corp., Montreal, for the year ending March 31, 1921, which will be presented to shareholders at the annual meeting on July 20, shows earnings of $7,212,750, after deducting all expenses and allowances. In the previous year the earnings amounted to $5,543,529. The publication of the report of the company, marks the passing of one of Canada's greatest corporations, it having been merged into the new British Empire Steel Corp.

Current and working assets have been decreased $1,347,163 and current liabilities have increased $657,554 making a total decline in excess of current assets over current liabilities of $2,004,717.

Large stocks of ore, limestone, ferromanganese and other materials were laid in last season to provide for operations during the winter. The cancellation by the government of its contract for ship plates and the abrupt change in conditions affecting export business, coupled with the prevalent slackening in domestic trade made it necessary to restrict operations of the steel works during the last half of the fiscal year. Improvements during the year cost $4,592,211 and include 60 new Kopper's coke ovens at Sydney, N. S., which are nearing completion.

The total production of coal from all collieries for the year ended March 31, last was 3,563,954 tons, as compared with 3,502,069 tons for the same period ending March 31, 1920. The following table shows the output of the principal classes of iron and steel for the past two years ending with March 31:

	1920	1921
Pig iron	184,229	207,678
Steel ingots	219,943	243,567
Blooms and billets for sale	26,165	68,994
Standard rails	68,068	68,994
Light rails	3,819	3,987
Wire rods for sale	44,436	55,853
Bars	1,245	2,207
Wire	15,542	23,122
Nails, etc.	12,386	15,556
Plates	3,252	38,894

Postpone Merger Plan

Final action on the proposal for the merging of the Central Steel Co., the Massillon Steel Co., and the National Pressed Steel Co., of Massillon, O., has been postponed until July 21 at a meeting of the stockholders of the three companies last week. Postponement was decided upon in order to obtain unanimous approval for the plan. Eighty-five per cent of the stockholders attended the recent meeting and it is reported they were ready to give their sanction. Some of the stockholders were unable to attend. The three companies are to be merged under the name of the Central Steel Co., and operated as divisions of the corporation, although for trade purposes, the present names of the individual companies will be retained.

Company Is Bankrupt

The Springfield Automatic Screw Machine Corp., Springfield, Mass., has filed a voluntary petition in bankruptcy disclosing liabilities of $374,111, and assets of $290,337. Previous to this action, Marcus A. Coolidge, president of the Fitchburg Machine Works, Fitchburg, Mass., made application for the appointment of a receiver for the corporation. He is the largest unsecured creditor, with a claim of $55,970, which is classed as "liquidation of a contract liability." The Fitchburg Machine Works is a creditor for $12,697. Other large creditors, outside of banks, are the Van Norman Machine Tool Co., Springfield, $10,476; National Forge & Tool Co., Irvine, Pa., $10,860; Frank H. Page, Longmeadow, Mass., and others, $25,000. The petition for the appointment of a receiver has been dismissed, as bankruptcy proceedings take precedure.

During June 801 new enterprises with an authorized capital of $100,000 or more, the total amounting to $675,977,800, were incorporated under the laws of the principal states, compared with 857 new companies with a combined capital of $601,044,000 in May and 997 incorporations with a total capital of $1,323,221,400 in June of last year. Since January 1, incorporations totaled $5,117,472,700, compared with $8,910,126,300 in the corresponding period last year.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

JOSEPH PAYTON, who has been elected president of the Staffordshire Iron and Steel institute to succeed Frank Somers has been active in British iron and steel circles for more than 20 years. He is at present secretary and director of the District Iron & Steel Co., Ltd., Smethwick, Birmingham. Previous to this election Mr. Payton served on the council of the institute for eight years and one year ago was made vice president. He is a native of Birmingham and was born in 1871. His education was completed at King Edward's school, Aston, and at the age of 16 he entered the office of Edmund Boughton & Co., Birmingham, iron and steel merchants, who in addition to their Birmingham business operate a tin plate works at Pontardulais, South Wales. At 19 Mr. Payton entered the office of the District company as second clerk and was promoted gradually to the position of secretary. His education along metallurgical lines was obtained at the Birmingham Municipal Technical school. He has been a member of the Birmingham Metallurgical society since its organization.

Joshua A. Hartfield, vice president of the American Bridge Co., is about to sail for Europe.

Albert L. Scott, vice president of Lockwood, Greene & Co., Boston, engineers, has returned from a two months trip to Europe.

W. C. Dickerman, vice president of the American Car & Foundry Co. returned July 1, from a trip to Europe.

Daniel M. Bates, traffic manager of the American Steel & Wire Co., Worcester, Mass., has been retired on pension after 36 years of service.

Bernard F. Supple, Boston, for 34 years secretary of the Massachusetts state board of conciliation and arbitration, has retired to enter private business.

George R. Keltie has succeeded John F. Sweeney as plant manager of the American Wringer Co., Woonsocket, R. I. Mr. Sweeney, who had been with the company for 32 years and had served in many capacities, has ended his connection with the business. The new manager has been employed at the plant for about a year in an executive capacity. George Schlosser will continue in charge for the receiver.

Joseph G. Vaudreuil, a superintendent for the Graton & Knight Mfg. Co., Worcester, Mass., has been transferred to Montreal, where he will be manager of its branch office.

JOSEPH PAYTON

William R. Adams, Chicago, has been appointed Illinois representative for the Kinney Mfg. Co., Boston, builder of electric, alcohol and air machines.

Josephs Michaels of the Hyman-Michaels Co., Chicago, sailed July 4 for a four-months tour in Europe, visiting England, France, Germany, Belgium and Italy.

S. B. Chase, who was formerly connected with the Waltham Wheel Co., Waltham, Mass., recently joined the western sales staff of the Heald Machine Co., Worcester, Mass.

Magnus Washington Alexander, New York, an engineer of the Central Electric Co., and managing director of the National Industries board, delivered the commencement address at Trinity college, Hartford, Conn., June 20, where he was the recipient of the honorary degree of master of science.

L. H. Chamberlain recently was appointed San Francisco agent for the Ajax Metal Co., Philadelphia. He maintains offices in the Call building, San Francisco.

Dr. Homer Gage, president of the Crompton & Knowles Loom Works, Worcester, Mass., has been elected by the alumni to the board of overseers of Harvard university, Cambridge, Mass., for a six-year term.

F. E. L. Whitexsell, for several years with the Railway & Industrial Engineering Co., Greenburg, Pa., has been made New England representative of the company with headquarters at 136 Federal street, Boston.

Floyd Rose, secretary of the Heppenstall Forge & Knife Co., Pittsburgh, has been made general manager of sales of the Heppenstall Forge & Knife Co. and also of the Heppenstall Forge Co.

Arthur A. Fowler, resident partner of Rogers, Brown & Co., New York, returned from a six months trip to Europe, July 1. His journey included tours of France, Spain, Italy, Norway, Sweden and other countries.

Earl B. Spencer, for many years with the Pierce-Arrow Motor Car Automobile Co., Buffalo, and during the war engaged in the manufacture of Hispano-Suiza Aircraft, has been made production superintendent of the Leach Biltwell Motor Car Co., Los Angeles.

H. J. Freyn, president of Freyn, Brassert & Co., Chicago, engineers, has sailed for an extended business trip through England, Holland, Belgium, France and other European countries, expecting to return in October.

Walter J. Kohler, president and general manager of the Kohler Co., Kohler, Sheboygan, Wis., has been elected president of the board of regents of the University of Wisconsin, Madison, which he has served as a regent for about eight years.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

ISAAC HARTER, assistant to the president of the Babcock & Wilcox Co., 85 Liberty street, New York, builder of boilers, stokers, etc., has been appointed general superintendent of the company, succeeding the late James P. Sneddon. Until a year ago Mr. Harter was superintendent of the Bayonne, N. J., works of the company, having been placed in that position in 1911 after a period as superintendent of the Stirling works at Barberton, O. Mr. Harter was born in Mansfield, O., in 1880. After graduation from the University of Pennsylvania, he entered the employ of the Aultman & Taylor Machinery Co., Mansfield, of which his father had been president. Starting in the boiler department, he later became its acting superintendent and a director in the company. When the company sold its boiler business in 1905 to the Stirling Co., Mr. Harter joined the staff of E. R. Stettinius, then the business head of the Stirling company which two years later was absorbed by the Babcock & Wilcox Co.

Wm B. Schiller, president of the National Tube Co., sailed for Europe, July 1.

George H. Lambkin has resigned from his association with William J. Cullen, New York, representative of the Sterling Wheelbarrow Co.

William A. Bostwick, president of the International Nickel Co., has been elected a member of the board of directors of the Bank of America, New York.

S. V. McLeod has been appointed purchasing agent of the Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont., succeeding L. L. Jacobs, resigned. Mr. McLeod's headquarters are in Sault Ste. Marie.

Capt. Harry K. Cage has been appointed manager of the Charlestown Navy Yard, Boston. The office is a new one recently created by the navy department.

Alexander B. C. Hardy, who for four years was president of the Waterloo Carriage Co., recently was elected president of the Olds Motor Works, Lansing, Mich. Mr. Hardy recently was made a member of the General Motors Corp. committee as its director of outside companies.

Frank J. Fahey, vice president of the Gillette Safety Razor Co., South Boston, Mass., will sail for Europe July 16 to visit the company's branches in London, Paris, Brussels, Copenhagen, Hamburg, Madrid, Milan and Geneva.

C. Fred Goddard, Paris, manager of the French branch of the United Shoe Machinery Corp., Boston, is on his vacation at his former home in Worcester, Mass.

William P. Barstow, for the past 20 years secretary and general manager of the Smith & Winchester Mfg. Co., South Windham, Conn., and with the company 36 years, has retired, being succeeded by Walter Abbe.

Charles R. O'Connell, formerly cost accountant for the navy department at the Bath Iron Works, Bath, Me., has become a deputy collector and inspector in the United States customs service in Providence, R. I.

Fred McFawn has resigned his position with the Stanley Works, New Britain, Conn., to become director of sale for the Hartmann Trunk Co., Racine, Wis. He is succeeded by Carl Messinger.

W. Barton Eddison, inventor of the jet entraining apparatus manufactured by the Surface Combustion Co., has been awarded the Edward Longstreth medal of merit by the Franklin Institute.

Everett Morss, president of the Simplex Wire & Cable Co. Boston who has just returned from a nine weeks trip to Europe, was given a welcome home banquet at the Boston City club, by his associates, June 27.

H. J. Thorkelson, M. E., business manager of the University of Wisconsin, Madison, for seven years, has resigned to assume new duties with the General Education board at New York, as director and consultant in organization, budget and financial management. He is a graduate of the college of engineering, University of Wisconsin,—class of 1898, receiving the degree of mechanical engineer in 1901. After serving four years with the J. I. Case Plow Works at Racine, Wis., he became a member of the state university engineering school faculty and in 1914 was promoted to business manager of the entire institution.

W. B. Wardrop, Indiana, Pa., was appointed bituminous mine inspector on June 25 by the governor of Pennsylvania to succeed the late Alexander Monteith. The announcement from the governor's office at Harrisburg states that the appointment dates from May 15.

Gen. T. Coleman DuPont, until 1915 president of the E. I. duPont de Nemours Co., Wilmington, Del., and at one time president of the Central Coal & Iron Co. in Kentucky, recently was appointed United States senator from Delaware, succeeding Josiah O. Wolcott, resigned.

Ernest Kruse, Bay Shore, L. I., N. Y., has succeeded Otto W. Siebert, Gardner, Mass., as treasurer and general manager of the Bay State Metal Wheel Co., and the Children's Vehicle Corp., both of East Templeton, Mass. Mr. Siebert is to develop the American Fiber Co., Gardner.

A. W. L. Gilpin, for six years manager of the Milwaukee branch and assembling plant of the Ford Motor Co., has been promoted to district manager in charge of branches at Detroit, Chicago, Milwaukee, Cleveland, Cincinnati, Columbus, Indianapolis and Louisville. A. B. Pease, his assistant for several years, becomes manager at Milwaukee. The change was effective July 1.

John W. Brassington, at one time chief engineer for Pusey & Jones, Wilmington, Del., shipbuilders, and latter chief engineer for the American Writing Paper Co., Holyoke, Mass., has been placed in charge of a new department established by the Port Arthur Shipbuilding Co., Ltd., Port Arthur, Canada, for the manufacture of pulp and paper machinery and digesters. His assistant will be John B. Purves who has had an experience of 26 years as a mechanical engineer in building this type of machinery.

Improvement Noted in Northwest

Industrial Operations Picking Up Gradually in Washington and Oregon, with the Straightening Out of Labor Tangles—Business Men and Manufacturers Greatly Encouraged—Construction Work Bringing Out Better Demands for Steel Requirements

Special Correspondence

Seattle, July 9.—General industrial conditions indicate a gradual improvement over a month ago. The undercurrent of feeling is much more hopeful. Throughout the state industries are reopening, unemployment is decreasing and the business and industrial world as a whole is greatly encouraged.

In Washington and Oregon many extensive road improvements are under way, giving employment to a large number of men and requiring considerable material. The building trades in Seattle and vicinity are more active and several large projects are either contracted for, or in preparation for the near future. The low price of lumber is an inducement to building.

The iron and steel trades are not active, although increased inquiries from the Orient are giving exporters greater confidence. A large surplus of resale material resulting from the suspension of steel shipbuilding has flooded the market, and in some instances upset price levels. It may take months for this material to be absorbed. Wholesalers are purchasing sparingly, replenishing their stocks only as required. The resumption of building has created a better demand for steel products, and if prices remain stable for a reasonable time exporters hope to place tonnages in the foreign markets.

Canners Not in Market

The canning situation is unsatisfactory. Large stocks of all classes of canned goods have been carried over from last year, and canners have been forced to carry material and equipment purchased at last year's high price levels. Consequently canners are not buying.

There is little business in the foundry trade. The strike of molders has been called off, but foundries are operating at only a small part of capacity. The foundries are having no labor troubles at present, but are having difficulty in finding work. As a rule they are well stocked with raw materials, and in consequence coke and pig iron are moving in limited volume.

Commerce generally has been hit hard by the strike of marine workers, this applying especially to coasting shipping. The strike has hampered the movement of freight. However, operators are finding less difficulty now in manning their vessels, although the coasters are still idle.

In the logging and lumber industry conditions are far from satisfactory. While wages generally have been reduced some operators are inactive because they can see no profit under the high cost of production and the comparatively low price of lumber. Production in this state and Oregon is about 30 per cent below normal.

Compared with prewar levels, commerce from this port is showing substantial gains but comparisons with a year ago show losses. The tonnage of exports in May 1921 shows a loss of 97,187 compared with a year ago, while imports register a loss of 98,652 tons. The losses are attributed to labor difficulties.

While there was a slight slump in building operations during last month as compared with a year ago, Tacoma and Portland show gains. Comparisons follow:

	May, 1921	May, 1920
Seattle	$1,566,005	$1,809,160
Tacoma	373,836	316,558
Portland	1,454,320	834,035

The supply of laborers and mechanics still greatly exceeds the demand, many men finding it difficult to obtain steady employment. Alaska mines and industries have drawn labor from this city while the grain and berry fields also have given employment to many. Competent help at going wages is easy to obtain.

The West Coast Machinery Co. has purchased the site on which the building now occupied stands. The site is 60 x 150 feet, and the purchase indicates the intention of the firm to locate permanently. The company deals in machine shop equipment and wood working machinery.

To obtain a larger area for dumping purposes the Pacific Coast Steel Co. has purchased six acres adjoining its plant in this city. The company purchased 18 acres two years ago. No immediate extension is contemplated.

Warehouse iron and steel prices were reduced 1.5 to 2.5 cents per pound on some items during the past week. Blue annealed sheets were cut 1.5 cents per pound while galvanized sheets and cold rolled shafting were reduced 2.5 cents and black sheets 2 cents. These changes were made to conform with readjustments in the East.

Founders' Urge Congress To Aid Railroads

The National Founders' association is urging its members to join in the nationwide movement of manufacturers to have congress improve the position of the railroads. It outlines the following plan for recommendation to senators and congressmen:

Abolish completely the agreements made during federal control by the railroad administration, represented largely by union labor leaders and union organizations represented by their national officers. The labor board has ordered the cancellation of these restrictive rules, but has ordered the railroads to make new agreements with various union crafts. Leaders of these organizations are demanding that the new agreements be practically identical with the one made during government control. Refusal of the railroads to the perpetuation of all these rules, which it is estimated cost the transportation interests of the country more than $300,000,000 annually, means that the labor board will be called upon to decide the question. Unless a firm stand is taken, conditions such as prevailed during government control will be made perpetual.

Restore to the individual railroads jurisdiction over questions of wages, classifications and working conditions.

Demand that congress immediately repeal the Adamson law, passed under duress and unquestionably one of the most hampering pieces of legislation affecting a legitimate industry ever enacted at Washington.

Prevail upon the government, in settling with railroads for the moneys it expended in additions and betterments, to fund the amounts due, permitting the repayment in 15 annual instalments rather than to demand payment of the entire amount at once. Further, that the government settle promptly with the railroads for the rental guaranteed them for their use during federal control. These two methods would release many millions of dollars and would at once afford help to railroad credit and avoid the present great hardship.

Mine Operators More Hopeful

Believe Demand This Year Will Be Sufficient at Least To Enable Them To Dispose of Their Stockpiles and Clear Way for New Production Next Winter—Oliver Company Employs 7000 Men—Tonnage Tax Revenue Is Disappointing

DULUTH, Minn., July 11.—Though the iron mining industry on the Minnesota ranges is in the doldrums, operators profess to see a silver lining to the cloud, and strong hopes are entertained that the worst has been passed. They base their expectations on an expected improved demand for pig iron and finished steel products in the near future which it is believed the ore trade will reflect.

The establishment of ore prices for the season at $1 below those prevailing last year has resulted in some sales of Mesabi range ores, and the operators hope at least to ship out the stockpiles at the mines before the close of the lake navigation season, thus affording employment for miners in this district next winter. A leading independent operator expresses confidence that the situation in the steel trade will improve to such an extent as to make it necessary to speed up the shipment of ore before the season closes.

Still Employs Many Men

After reducing its force of miners last month, the Oliver Iron Mining Co. still is employing nearly 7000 men. The company is continuing to develop mines where work has been underway tor some time. Included in the list is the Wellington mine at Chisholm, Minn. which after extensive work for two years is now producing from 15,000 to 20,000 tons of ore a month. The company proposes to deepen the shaft at its Wanless mine at Buhl, Minn. The company has completed the development of its new townsite in South Hibbing but will not proceed to mine the ore body underlying old Hibbing until next year, pending decisions in two suits involving rights ot possession.

Independent companies which are active to some extent include the Tod-Stambaugh Co., with the Dean and Dinwoody mines; the Republic Iron & Steel Co., at Plummer, Wis., the Jones & Laughlin Co., operating the Hill-Annex mine; the Mahoning Iron Co.; M. A. Hanna & Co.; Pickands, Mather & Co.; John A. Savage & Co., and the Chippewa Iron Mining Co., operating the LaRue mine. Savage & Co. are doing development work and erecting buildings at the Sagamore mine on the Cuyuna range. They have placed one of their freighters in commission to ship ore that has been on the stockpile at its Croft mine.

The Chippewa Iron Mining Co. has developel a large ore body at the LaRue mine, and it is obtaining bids for the building of a 4 1-2-mile spur track, from the Duluth & Iron Range railroad to the mine.

The Marquette Ore Co. is continuing development work at the Maroca mine on the Cuyuna range. An approach 1000 feet long is being cut from the south side of the pit to the railroad.

Mining men here are interested in prospective developments in the Gunflint, Minn., district. The Paulson mine located four miles this side of the Canadian boundary has been acquired by the Palatine Mining & Development Co., which has purchased the former Mackenzie & Mann blast furnace plant at Port Arthur, Ont. The product of the mine will be shipped to the furnace. A large ore body is said to have been found at the Paulson mine. The Port Arthur & Duluth branch of the Canadian national railroad has been extended 22 miles to the mine and shipments to the furnace are expected to be started this summer.

In a statement regarding the Gunflint district just issued, F. A. Widdes, Minnesota state superintendent of mines claims that "untold millions" of tons of crude ore are located there, capable of beneficiation on a commercial scale. The state owns many thousand acres of land in the mineral area and it proposes to take steps to promote development.

Tonnage tax advocates who pushed through tax legislation at the last session of the Minnesota state legislature are disappointed over the outlook for revenue from that source this year. It was estimated the tax would net the state approximately $4,500,000 a year, with the mines operating normally. On the basis of present shipments, it is feared the tax will not produce more than half that amount. Outputs of the state-owned mines are expected to be relatively larger than at the other properties as they are held under leases that call for a payment of only 25 cents a ton to the state. Seven of those state owned mines with an estimated tonnage of 91,824,598 tons have only twenty years to run under lease and the companies will require to move about 4,100,000 tons annually from them. Another group of 17 state mines estimated to contain 56,916,000 tons, must be mined within 28 years or at the rate of 2,600,000 a year. Those totals do not include many million tons of low grade ore also known to exist in those mines.

Business interests in Duluth were impressed by the action of the Minnesota Steel Co., in giving employment to 1400 of the 1700 men who were thrown out of work through the closing down of its furnace plant recently. The men have been engaged in construction work at the company's wire and sheet mills. The United States Steel Corp., announces that it proposes to complete the mills for operating next year.

Copper Production Gains

Compilations by the United States geological survey show the quantity of copper produced at smelters aggregated 1,310,972,580 pounds in 1919 as compared with 1,150,137,192 tons in 1914 an increase of about 14 per cent. Arizona leads among the states with 536,515,368 pounds which is more than 50 per cent of the total. Primary copper of domestic origin produced at refineries was 1,441,643,000 pounds in 1919 and 1,210,423,000 pounds in 1914. The total refined copper of primary and secondary origin both domestic and foreign amounted to 1,863,580,000 pounds for 1919 compared with 1,565,708,000 pounds for 1914. This is an increase in five years of 297,872,000 pounds or 19 per cent. Thirty-three establishments operated in 1919 while in 1914 the number totaled 37.

The Phoenix Mfg. Co., Lowell, Mass., maker of patent automatic firearms, has been petitioned into bankruptcy by three creditors.

Ingot Output

In June Tapers Down to 1,003,406 Tons —Near Low Point

Output of steel ingots after a slight improvement during May, again fell in June and totaled only 1,003,406 gross tons, according to figures compiled by the American Iron and Steel institute from reports of 30 companies which in 1920 produced 84.2 per cent of the output of the United States. Compared with the May production of 1,265,850 tons, the June figure registered a loss of 262,444 tons. This loss represented 20.7 per cent. As was also the case in May, the June output was the lowest rate of indicated output since 1908 when the production of the country totaled 13,677,027 tons.

Following are the institute's production figures for 1920 and the first six months of 1921:

1920	Open hearth	Bessemer	All other	Total
Jan....	2,242,758	714,657	10,687	2,968,102
Feb.....	2,152,106	700,151	12,867	2,865,124
March..	2,487,245	795,164	16,640	3,299,049
April...	2,056,336	568,952	13,017	2,638,305
May....	2,251,544	615,932	15,688	2,883,164
June....	2,287,273	675,954	17,463	2,980,690
Total 6 mos.	13,477,262	4,070,810	86,362	17,634,434
July....	2,135,633	653,888	13,297	2,802,818
Aug....	2,299,645	695,003	5,784	3,000,432
Sept....	2,300,417	693,586	5,548	2,999,551
Oct....	2,335,863	676,634	3,485	3,015,982
Nov....	1,961,861	673,215	3,594	2,638,670
Dec....	1,687,162	649,617	3,586	2,340,365
Total for year..	26,197,843	8,112,753	121,656	34,432,252
1921				
Jan....	1,591,281	608,276	3,629	2,203,186
Feb....	1,295,863	450,818	2,796	1,749,477
March..	1,175,591	392,983	2,404	1,570,978
April...	1,000,053	211,755	2,150	1,213,958
May ..	1,047,810	216,497	1,543	1,265,850
June....	808,286	193,644	1,476	1,003,406
Total 6 mos.	6,918,884	2,073,973	13,998	9,006,855

Based upon working days in May and June, the average daily output of the 30 companies was 38,592 tons or 45,833 tons for the whole country. The corresponding figures for May were 50,634 tons and 60,128 tons respectively. June was a month of 26 working days compared with 25 working days in May. Calculated upon the June rate of output, the annual rate of production for the 30 companies was approximately 12,000,000 tons, which was 3,750,000 tons below the May rate. The June production indicated the annual rate for the entire country to be approximately 14,350,000 tons compared with the 18,700,000 rate of the preceding month. Thus the June rate of output is slightly better than the record low monthly average of 1908.

The six months' total of the 30 companies for 1921, is shown to be but little more than one-half of the corresponding period of 1920. The total for the present year stands as 9,006,855 tons and for 1920 at 17,634,434 tons, or a loss of 8,627,579 tons.

Obituaries

PROF. Francis Bacon Crocker, founder and vice president of the Crocker-Wheeler Electrical Co., Ampere, N. J., and for many years head of the department of electrical engineering at Columbia university before his resignation in 1914, died in New York, July 9 after a long illness. Prof. Wheeler was 60 years old. Following his death, Thomas A. Edison characterized him as one of the leading electrical engineers of the world. His most important contribution was the creation with Charles G. Curtis and Dr. Schuyler S. Wheeler, of the commercial motor, the first of which was put into use in 1886 and it was the forerunner of all the motors now in use. Prof. Crocker later effected many improvements in motors and was credited with scores of patents on their construction and application. In addition to his scientific and scholastic work he was active in being one of the founders of the C. & C. Electric Co. During the war, he was an advisor of the naval consulting board, of which he refused to become a member on account of poor health. In 1917, with Peter Cooper Hewitt, he developed the first helicopter in this country, which was able to fly. The government took over this invention and was preparing to manufacture it for use in France when the armistice came. Many of Prof. Crocker's researches into the problem of curvature for airplane wings resulted in discoveries which now are in everyday application. He was a former president of the American Institute of Electrical Engineers, the Electrical Power club, the New York Electrical society and a past secretary of the International Electrical Congress.

William L. Finch, formerly a manufacturer of wire nails at Anderson, Ind., died recently at Cincinnati. Mr. Finch was one of the founders of the Hazen Wire Nail Co. 30 years ago. He was 74 years old.

Harry M. Gray, president and general manager of the Como Chemical Co., Kokomo, Ind., died recently. Mr. Gray went to Kokomo in December, 1919 as president and general manager of the Como company. He was compelled to relinquish his active duties with the company about six weeks ago owing to failing health. He was 33 years old. With the rank of lieutenant he was with the first American troops to be sent overseas. At the front he was a victim of German mustard gas.

Charles O. Tinker, who retired in 1907 as president of the Phoenix Foundry & Machine Shop, Ashtabula, O., died July 1 at the age of 70 years. Fifty years ago he and his father purchased the business.

Robert B. Lang, president of the R. B. Lang Mfg. Co., Racine, Wis., hardware specialties, metal stampings, nickel plating, etc., died recently after a long illness. He was 77 years old and a native of Canada. He served through the Civil war and was commissioned a captain.

John Jernberg, for the past 39 years instructor in forge practice at the Worcester Polytechnic Institute, Worcester, Mass., dean of the instructors and considered to be one of the most expert metallurgists in this country, died suddenly in Sweden, recently, aged 60 years. He left Worcester, May 27, for a visit to his old home and died from a paralytic shock. Mr. Jernberg was to have been retired on a pension under the Rockefeller Foundation this fall. One of his three sons, Henry Jernberg, is manager of Fairbanks, Morse & Co., New York, builder of engines, while another is editor of the publications of the American Steel & Wire Co., in the Worcester district.

Henry S. Manning, who retired in 1904 as senior partner of Manning, Maxwell & Moore, New York, manufacturers and dealers in machine tools and allied lines of equipment, died July 10 at his home in that city, aged 76 years. Mr. Manning until recent years had long been associated with the machine tool industry, and was founder of the company which now bears his name. In the Spanish-American war at his suggestion and under a special act of congress his firm fitted out a "floating repair shop," a vessel that followed the fleet, equipped with every form of tool for repair work. Mr. Manning was studying at Yale with the class of 1862 when he left to fight for the Union, rising to the command of the 10th corps d' Afrique, the second colored regiment to enter the service.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

OFFICES and warehouses of the Barde Industrial Co., Seattle, being built by the Haddow Engineering Co. on First avenue south, Seattle are expected to be completed this week. They will constitute one of the most modern machinery and steel warehouses on the Pacific coast. More than two city blocks are occupied by the buildings and grounds, the actual space of the buildings being 60,000 square feet. Much outside storage is available. More than 10,000 tons of steel, including plates, shapes, bars, tool steel, rails, tubes, wire and wire rope, and lathes, cranes, hoists, punches, compressors, motors, air tools, etc., will be handled by the plant. This includes stock of the Vulcan Mfg. Co. and navy and shipping board surplus material. Railroad tracks, locomotive cranes, and overhead cranes will serve the plant. The Barde Industrial Co. is affiliated with the Barde Steel Products Corp., M. Barde & Sons, and Barde & Bros., with offices in Seattle, Portland, Oreg., Vancouver, B. C., San Francisco, Los Angeles, New York and Yokohama.

* * *

ENLARGEMENT of its terminal at Denison, Tex., construction of a new roundhouse at that point; addition to its yard, roundhouse and freight station at Fort Worth, Tex.; and other roundhouse improvements at Waco, Smithville, and Houston, Tex., and a freight house addition at Wichita Falls, Kan., is contemplated by the Missouri, Kansas & Texas railroad.

* * *

THE National Scale Co., Chicopee Falls, Mass., builder of counting machines and elevator trucks, has filed a voluntary petition in bankruptcy, with liabilities of $172,743, and assets of $152,561. There are nearly 200 creditors. The company was incorporated in 1909 with $144,800 capital stock, F. D. Howard being president, and L. I. Howard, treasurer and clerk.

* * *

RANGE boilers, the first manufactured west of the Rocky Mountains, now are being built by National Steel Construction Co., Seattle, at its Duwamish waterway plant. The company, already maintaining a fabrication and shipbuilding plant, added a galvanizing plant, a pickling plant, and special machinery and equipment to cover the new line of production. The new shop, with a capacity of 80 boilers a day, is expected to be increased until the company can supply the entire needs of the Pacific northwest.

* * *

THE Standard Stamping Co. has changed its name to the Armstrong Mfg. Co. Action of the company, which is an Ohio organization capitalized at $300,000, in changing its name, resulted from the fact it recently began the manufacture of the Armstrong stove, a patent of C. C. Armstrong, general manager, and it was found the name of the Armstrong Mfg. Co. lent itself more readily to the advertising. The company manufactures hardware and electrical appliances.

* * *

PROPERTY of the New York Steam Co., New York, which supplies heat and power to New York buildings, has been purchased by Moses, Pope & Trainer, 366 Fifth avenue, New York, industrial engineers, at an auction sale held under direction of special masters appointed by the United States district court. The bid was for $1,780,000 and in addition obligations totaling $300,000 are to be assumed. The sale was brought under general gold bond mortgage. The engineers have not announced their plans for operation of the plant.

* * *

ORGANIZED with a capitalization of $200,000, the Penn-Empire Coal Inc., has established headquarters at 406 Empire building, Pittsburgh. It will conduct a general wholesale coal and coke business for the purpose of marketing its production at Oakdale, Pa. on the Pan Handle railroad and at Evans City, Pa. on the Baltimore & Ohio. This company also is exclusive sales agent for other producers of coal and coke located in western Pennsylvania, West Virginia and eastern Ohio. R. B. Loos, formerly Pittsburgh resident manager of the Walter-Wallingford Coal Co., and C. E. Kitchen, formerly sales manager of the Iron Trade Products Co., were organizers, and Mr. Kitchen is general manager of the new company.

* * *

THE Northern Aluminum Co., of Shawinigan Falls, Que., has received an order from the Victoria State Electricity commission of Australia for 700 miles of ¾-inch aluminum, steel-reinforced cable. The packing will be done on reels, each containing three-fourths of a mile of cable, and it is anticipated that all will be delivered at Melbourne by the end of the year. The f.o.b. steamer price is estimated at £91,416 and the commission claims that the price of the cable landed at Melbourne will be at least £30,000 less than the lowest tender for copper cable, duty paid, and landed at the same city.

* * *

WITHDRAWING from Taylor & Dean, Pittsburgh, manufacturers of ornamental wire, R. O. Belles and Fred C. Werry have joined Thomas H. Werry Jr. in organizing the Builders Steel Works Co. which, capitalized at $250,000, has taken over the business and plant of the Buechele Iron & Tool Co., 4130 Liberty avenue, Pittsburgh. Charter has been applied for and the manufacture of structural and ornamental steel work, fire escapes, fireproof porches, wire work, etc., will be continued. Mr. Belles is president of the new company, Fred C. Werry vice president and Thomas H. Werry Jr. secretary and treasurer.

* * *

A LONG term lease on 40,000 square feet of space, comprising the entire second floor of the Terminal building, has been taken by the American Grinder Mfg. Co., Milwaukee. This was done in order to effect a consolidation of works and offices and gain considerable additional capacity for manufacturing portable grinders, tools, etc. The main plant of the company now is at 2203 Sycamore street, with branch shops at Sixteenth and Clybourn streets, and 717 Poplar street. The work of moving the equipment into the new plant will begin at once so that the transfer may be completed and production resumed within a few days. Louis E. Bertane is vice president and general manager of the company.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE contract for equipping one of the largest timber mill plants in the United States has been taken by the McDonough Mfg. Co., Eau Claire, Wis., builder of sawmill and general woodworking machinery, metalworking tools, and special machinery. The mill is being erected by the National Lumber & Timber Co., Chicago, in its large timber yards in that city, covering nearly 50 acres. The machinery is designed to handle timbers as large as 40 x 40 inches and 100 feet long. It includes a 60-foot timber carriage. The contract also calls for the installation of a vertical resaw in the planing mill of the National company. Delivery has been promised in 60 days which will make it necessary to enlarge the working force of the McDonough shops.

* * *

AMONG the electric furnaces recently reported sold by the Electric Furnace Co., Alliance, O., are one to the Empire Brass Mfg. Co., Ltd., London, Ont.; three to the Mueller Metals Co., Decatur, Ill., for melting brass; and one to the Ingram Richardson Mfg. Co., Beaver Falls, Pa., for enameling purposes.

* * *

REORGANIZED from an old established business the Elwood Foundry & Machine Co., Ellwood City, Pa., has been incorporated under the laws of Pennsylvania with $75,000 capital authorized. Eventually the company will be in the market for a steel building approximately 50 x 200 feet, a 5-ton overhead electric traveling crane, molding machinery, wood working machinery and machine tools. G. F. Zehner is president of the company, J. S. McFeatters vice president and C. W. Carbeau secretary and treasurer.

* * *

WORK has been started by the Fresno Tire & Rubber Co., 816-18-20 Mattei building, Fresno, Cal., on the erection of a large tire plant, which is expected to be ready for operation by the first of next year. The plant will have a daily capacity of 500 cord tires and 1500 inner tubes. Officers of the company are: President and general manager, J. H. Christian; vice president, F. H. Pletcher; treasurer, Edgar L. Ide; and secretary, C. A. Bunnell. The company, which was incorporated under the laws of Nevada, is capitalized at $2,000,000.

* * *

A HANKEY & CO., Inc., Rochdale, Mass., maker of machine knives, drop forgings, magnets and steel rolls, of which the Rogers Drop Forging Co., Worcester, Mass., is a subsidiary, is to increase its capital stock by $300,000. It will be raised by a bond issue and the proceeds will be used to pay for the Worcester plant and for additional working capital.

* * *

THE National Machinery Sales Co., Chicago, whose incorporation we recently noted has opened offices at 28 North Desplaines street. James L. Gough is president and treasurer, James Jay Sheridan, secretary and George D. Benson, assistant secretary. These men are well known to the machine tool trade, Mr. Gough until recently being president of the Federal Machinery Sales Co. of Chicago, and has been in the machine tool business for more than 25 years. Mr. Sheridan is a well-known Chicago lawyer and banker, and until recently was vice-president of the Federal company.

* * *

CONTACTOR tubes for various devices, including thermostats, heat regulators and pressure regulators, will be manufactured by the Absolute Con-Tac-Tor Corp., Beloit, Wis., which was recently incorporated with a capital stock of 100,000 shares of preferred stock and 3000 of common, of no par value. At present the company is operating in leased quarters but is contemplatnig the erection of a modern plant. Offices are located at 126 Shirland avenue, Beloit. Officers of the company are: President, A. B. Melville; vice president and general manager, C. E. L. Lipman; treasurer, E. Lipman and secretary, L. A. M. Phelan.

* * *

A NEW brass and bronze foundry and machine shop which is being erected in Milwaukee by the American Metal Products Co., 678 Kinnickinnic avenue, on a new site at Thirty-eighth avenue and Burnham street, will have as its principal item of equipment a 1000-pound melting furnace, to be installed by the Detroit Electric Furnace Co., Detroit. The construction work will be completed within a short time and it is hoped to have the first heat about July 25. The company then will seek tonnage business. Heretofore it specialized in bearings and bearing metal made under patented formula.

* * *

THE Logan Husker Co., Bellefontaine, O., has been organized and recently purchased the Mahlon Hostettler plant, formerly the Ironwood Mfg. Co., Bellefontaine, for the manufacture of huskers, feed cutters, etc. Clinton Bowen is president of the new company, J. S. Kauffman is vice president, R. E. Black secretary and George Bowen treasurer. Mr. Kauffman is an officer in the Kauffman Metal Products Co., Bellefontaine, and Mr. Black is a certified public accountant engaged with the American Seeding Machine Co., Springfield, O. Associated with them will be Mahlon Hostettler and Samuel B. Fenner. Mr. Fenner, who is to be superintendent, has been sueperintendent of the Fate, Root, Heath Co., Plymouth, O., builder of gasoline engines.

* * *

THE plant of the DePere Mfg. Co., DePere, Wis., boiler, tank and stack builder, is being overhauled and improved with a view to early resumption of operations under the management of the J. F. Davis & Sons Co., Chicago, which has acquired the property. The DePere Mfg. Co. was organized about six years ago and took over the DePere works of the Lyons Boiler Works, which went through bankruptcy. The plant has been inactive for several months. The new owners operate plants in Hopewell, Va., Carney's Point, N. J., and Boston, manufacturing boilers, tanks, stacks and structural steel plate work. It is capitalized at $500,000 and has been granted a Wisconsin charter, the application for which indicates an investment of $200,000 at DePere. J. F. Davis is president and general manager.

Some Betterment

Shown in Demand for Refractories—Steel Plant Inquiry Light

Pittsburgh, July 12.—While fire clay and silica brick demands from the iron and steel industry continue at a low ebb, a comparative improvement is noted in silica and bauxite brick for the glass trade. One large glass producer has seven out of its 12 furnaces going and is understood to have placed orders for 15 or 20 carloads of brick recently. Other glass operations are on a similar scale. Both sales and inquiries from blast and open-hearth furnace operators however, are few and far between, although a few became current during the past week, which under present circumstances are considered fairly sizable; one still being before some sellers, calling for one-half million brick for open-hearth construction. By some brick manufacturers, this is thought to be an effort to sound out the market. Chrome brick, on July 6 commenced to be quoted at $55 instead of $60 per ton, a cut of $5.

Stocks of brick in the hands of makers, particularly silica, are not considered large, due to curtailed operations inaugurated during recent months. Some of the smaller manufacturers have heavier stocks than the larger makers. The case of one small maker is cited, which has a million silica brick in stock, whereas a producer rated considerably larger only has 50,000 brick. Stocks of fire clay brick are said to be larger than silica. A number of kilns are down entirely, while others operate spasmodically on a partial basis. One plant started up early this month after a shutdown of four or five weeks to replenish depleted stocks. Refractories manufacturers of Pennsylvania are holding a meeting today at Bedford Springs, Pa.

Chicago reports the closing down of plants during the summer lull has been the signal for overhauling boiler settings and for general repair work requiring fire clay brick. Nearly all prices show signs of softness. Missouri brick in this market has dropped about $5, but Illinois brick is nominal as quoted a month ago.

Fire Clay Brick

(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$36.00 to 43.00
Pennsylvania, No. 2	30.00 to 35.00
Ohio, No. 1	36.00 to 40.00
Ohio, No. 2	30.00 to 35.00
Illinois, No. 1	40.00 to 45.00
Illinois, No. 2	30.00 to 40.00
Kentucky, No. 1	36.00 to 40.00
Missouri, high grade	40.00 to 45.00
Missouri, No. 1	30.00 to 35.00
Maryland, No. 1	40.00 to 55.00
Maryland, No. 2	36.00

SILICA BRICK

Pennsylvania	$35.00 to 40.00
Chicago	40.00 to 42.00
Birmingham	46.00 to 50.00

MAGNESITE BRICK
(Per Net Ton)

9 x 4½ x 2½	$70.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$55.00

BAUXITE BRICK
(Per Net Ton)

9" straights, 55 per cent.	$50.00
9" series shapes, 55 per cent.	55.00
9" straights, 76 per cent.	90.00
9" series shapes, 76 per cent.	95.00

Steel Company To Import Ore from Mexico

Guadalajara, Mexico, July 7.—American financial interests which are said to represent an important independent steel company are preparing to ship by water large tonnages of high grade iron ore from a deposit adjacent to the Pacific coast, in the state of Colima. Wharves are being built at the deep water port which is being developed for ocean vessels. It is stated a railroad will be constructed from the mines.

Preparations are being made by the Montery Iron & Steel Co., which has purchased a part of the great Iron Mountain at Durango, to make large shipments of the ore to its iron and steel plant in Montery.

Seek Cut in Power Cost

Several of the steel manufacturers of Indianapolis have signed a petition filed with the Indiana public service commission asking for a reduction of power rates proposed by the two Indianapolis power companies. The manufacturers want the surcharge rates reduced approximately 50 per cent. They declare that when the last increase was awarded the companies, coal was selling for $4.22 a ton and this price was one of the reasons for the grant. Since then, the petition states, coal has dropped about $1 a ton.

Builds 451 Steel Ships

Washington, July 12.—In the year ended June 30, ships built in the United States and numbered by the bureau of navigation totaled 1429, of 2,210,221 gross tons, not including 33 vessels of 66,038 gross tons built for foreign owners. Steel ships totaled 451, of 2,016,800 gross tons, or all but 193,421 tons of the total. Of the steel tonnage, 1,373,444 tons were turned out on the Atlantic and Gulf coasts, 543,603 on the Pacific and 90,839 in yards on the Great Lakes. Out of the 451 steel ships 352 were steam, 30 gas, 68 unrigged and one a sailing vessel.

Little Buying

Being Done in By-Products—Prices Generally Are Maintained

New York, July 12.—Buying of coal by-products continues greatly restricted. The lacquer and varnish manufacturers are buying some benzol and solvent naphtha, but aside from this, there is little interest. This is especially true of demand for naphthalene which, for the past three or four weeks, has been exceedingly dull. Such demand as is coming out from the varnish and lacquer manufacturers is principally for benzol and solvent naphtha. The rubber interests are also buying a little of these products, but this trading is negligible.

Notwithstanding the general dullness, prices are being maintained. Pure benzol for spot shipment is still holding at 27 cents per gallon, f.o.b. producers' plants, for material in tanks, and at 31 to 33 cents in drums. Ninety per cent benzol is quoted at 25 cents in tanks and 26 to 31 cents in drums, and toluol is quoted at 38 cents in tanks and 28 to 34 cents in drums. Solvent naphtha is quoted at 25 cents and 28 to 31 cents in drums.

Prices on phenol also are unchanged, holding nominally at 15 to 17 cents per pound, producers' plants, while naphthalene is being quoted at 8½ cents in flakes, and 9½ cents in balls.

Offers of sulphate of ammonia at $2 to $2.25, delivered seaboard, are being made but little or no business is being done.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.27 to .33
Toluol	.28 to .34
Solvent naphtha	.25 to .31

Per Pound at Producers' Plants

Phenol	$0.15 to 0.17
Naphthalene, flake	$0.075 to $0.085
Naphthalene, balls	$0.085 to $0.095

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$2.20 to $2.50

Contract

Pure benzol	$0.27 to .33
Toluol	.28 to .34
Solvent naphtha	.25 to .31

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

Furnace Is Blown In

The furnace of the Robesonia Iron Co., Robesonia, Pa., was blown in on low phosphorus iron, July 5. The furnace was lighted by Miss Isabella Lukens, daughter of W. W. Lukens, president of the Alan Wood Iron and Steel Co.

Tool Inquiry Shows Some Activity

Dealers Hope for Better Business During Last Half, Basing Expectancy on Requests Being Received—Aggregate Not Particularly Large, Nor Were Sales, in Past Week—Three Sales Made Averaging $15,000

AN APPARENT increase in the number of inquiries for machine tools, machinery and other shop and plant equipment in the past week indicates, to many who have been waiting for signs of an upturn in the mechanical equipment market, greater activity in the last half of the year than in the first six months. None of the new inquiries may be termed sizable but the aggregate represents a fair amount of possible business and, if orders follow, may stimulate an industry which so far this year has been about as much affected as any in the present business depression.

Some sales were made in the past week, but these, with a few exceptions, were scattered and were not large either in the aggregate or in single items. One exception was a total of $29,000 worth of machinery and machine tools placed with a Cleveland dealer. Of this, $16,000 represents 18 used tools sold to federal board of vocational training for use at Valparaiso, Ind. The other $13,000 was for contractors' supplies. Another exception was $15,000 spent by a Connecticut textile mill for a planer, three lathes and a milling machine. A Pittsburgh steel company bought a 2000-ton press while a Southern user bought a bulldozer. Three roll lathes went to Huntington, W. Va. Featuring the sales of the week were several lots which were closed at auction. This was at Chicago and Worcester, Mass. The sales at Chicago were not well attended and the prices are reported as being disappointing. Dealers showed little or no interest and users only a little more. At Worcester, a lot of 350 machine tools and other machinery and equipment were sold at prices said to be satisfactory under present conditions. This sale dismantles the plant of the Iverson Piano Player Co. which is to be dissolved.

The railroads have continued to remain out of the market, although the New York Central and the Rock Island are expected to close soon on some small lists. The automobile industry has taken a few single items at times but the aggregate has been small and is not regarded as reflecting any increased activity in that industry.

Crane requirements are small. Only one list apparently aroused any interest. That was by a New York consulting engineer for 22 electric overhead cranes, ranging from 5 to 50 tons capacity each, for a domestic project. One sale was reported, Altoona, Pa., schools taking a 10-ton hand-power crane with a 22-foot span.

Scattered Orders Prevail; 22 Cranes Wanted

NEW YORK, July 12.—Business in the local machine tool market is confined to small, scattered orders, principally for single machines. Included is the purchase of three roll lathes by the International Nickel Co., 43 Exchange place, for its plant at Huntington, W. Va. It is reported the order went to the United Equipment & Foundry Co., Pittsburgh. The International company is still in the market for four squaring shears, two to be ot 108 inches each and two of 144 inches.

Domestic inquiry generally is showing little improvement, remaining almost at a standstill. The betterment expected in railroad demand has not materialized and few now are looking for any perceptible improvement within the next few weeks.

While the placing of substantial orders for rolling stock by railroads of Mexico and the Orient recently has added to the optimism regarding business in those parts of the world, no important buying of machine tools has developed during the past week and few new inquiries of consequence have come out.

Of interest to the local trade was the recent bankruptcy sale of the Modern Machinery Exchange, this city. About 250 machines, both new and used, were offered, and it is understood they brought about 30 cents on the dollar.

Outstanding in the crane market is a list involving 22 electric overhead cranes, ranging from 5 to 50 tons in capacity. The list was issued through a consulting engineer of this city, the equipment to be installed in a plant to be erected in this country. It is understood several of the cranes were specified as alternates, so it is likely that not more than 15 cranes will be purchased.

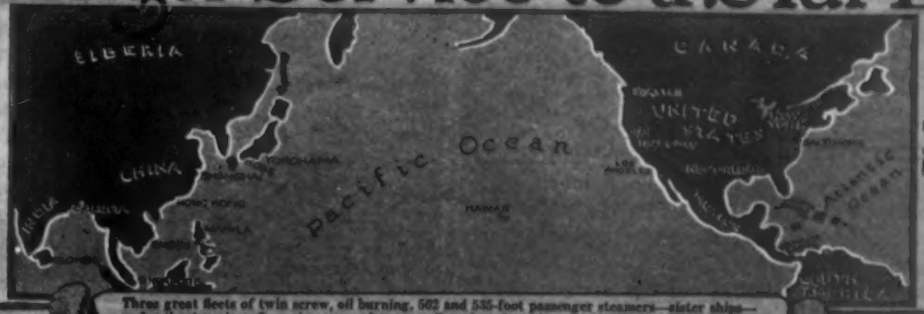
The crane market otherwise is featureless. There is little improvement in demand for handpower cranes, but it is far from pronounced. A recent order of this character called for a 10-ton handpower crane, with 22-foot span, for the public schools, Altoona, Pa. The business was placed with the Chisholm & Moore Mfg. Co., Cleveland. An inquiry is current through several local equipment dealers for a 2-ton underhung handpower crane, with 15 foot span, for shipment to New Mexico. Ray Hauck, Reading, Pa., is expected to close shortly on a 5-ton electric crane, with 40-foot span.

Holidays Add to Dullness

BOSTON, July 12.—Influenced partly by the recent holidays, business in the machinery market of New England was quiet last week. An important inquiry which was outstanding at the end of last week has been closed, but with this exception practically no sales of heavy tools have been reported. Dealers report no inquiries, prices have not changed and the second hand market is stagnant.

The large Connecticut textile mill order which was pend-

Passenger Service to the Far East



Three great fleets of twin screw, oil burning, 502 and 535-foot passenger steamers—sister ships—under the American flag, give a complete as well as fast, luxurious service to the traveler from the United States on the West Coast to Honolulu, Manila, Japan, China and to Calcutta and Ceylon in the Far East and from the Atlantic to the Pacific Coast and Honolulu via Havana and Panama Canal.

ADMIRAL LINE
PACIFIC STEAMSHIP COMPANY

THE SHORT ROUTE BETWEEN SEATTLE, YOKOHAMA, KOBE, SHANGHAI, HONGKONG AND MANILA.

The U. S. Shipping Board vessels embody the latest developments in marine construction for safety, comfort and luxuriousness.

All outside staterooms, ventilating system for cooling the air on vessel and private baths. Every form of entertainment. Cuisine is all that the most fastidious and critical could desire.

For the veteran tourist, no more superb conditions for sea travel could be imagined.

SAILING DATES

SILVER STATE	JULY 6
KEYSTONE STATE	JULY 20
WENATCHEE	AUGUST 27

U. S. flag ships sail from New York City, with Havana, for Seattle via Havana and Panama Canal.

HUGH GALLAGHER, Gen. Eastern Agent, 17 State St., New York City

PACIFIC STEAMSHIP COMPANY, Seattle, Washington, or any Tourist Agency

Sheltered verandas opening off, a popular lounging place

Trained stateroom with private bath

MATSON LINE

A DELIGHTFUL, interesting vacation cruise from the Atlantic to the Pacific without change of steamer. An ever-changing and unforgettable panorama of quaint foreign scenes in semi-tropic seas, with cool and luxurious conditions that are conducive to real rest and recuperation. Abundant time for shore visits. Outside staterooms only, all with beds (not berths), electric fans and ventilating system, private bathrooms with showers, etc. All amusements for young and old.

BALTIMORE — HAVANA—PANAMA—SAN FRANCISCO—HONOLULU

SAILING DATES

BUCKEYE STATE	JULY 30
HAWKEYE STATE	EARLY SEPTEMBER

Weekly service to and from San Francisco and Honolulu.

MATSON NAVIGATION COMPANY, 25 South Gay St., Baltimore, Md. 120 Market St. San Francisco, or any Tourist Agency

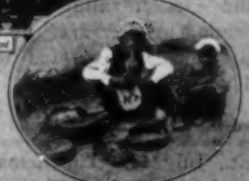
Dining Saloon on a Ship but

The Palm Garden Tea Room is a distinctive feature

PACIFIC MAIL STEAMSHIP CO.
"THE SUNSHINE BELT TO THE ORIENT"

1. TRANS-PACIFIC LINE—San Francisco to Japan, Shanghai, Hongkong and Manila.
2. MANILA-EAST INDIA LINE—San Francisco to Honolulu, Manila, Saigon, Singapore, Colombo and Calcutta.

A Chinese street merchant


An East Indian snake charmer

A cruise under the American flag on one of the oil burning 17½-knot U. S. Shipping Board vessels, as luxurious in every appointment, with outside staterooms, beds (not berths), electric fans and cooling ventilating system, offers tourists the very finest service on Pacific waters.

Spacious decks with all amusements, beautifully furnished lounge, social and smoking rooms add greatly to the comfort and well being of the passengers.

SAILING DATES

TRANS-PACIFIC LINE		MANILA-EAST INDIA LINE	
JULY 23	EMPIRE STATE	JULY 14	GRANITE STATE
AUGUST 6	GOLDEN STATE	AUGUST 13	CREOLE STATE

PACIFIC MAIL S. S. CO.
10 Hanover Square, New York City
621 Market Street, San Francisco, or any Tourist Agency

A native cart in the Philippines

U. S. SHIPPING BOARD
Washington, D. C.

ing last week and has since been closed aggregated something in excess of earlier estimates. One planer, three lathes and one milling machine brought some $15,000.

The property of the Iverson Piano Player Co., Worcester, Mass., consisting of about 350 lots and including machinery, machine tools and the mechanical equipment, has been disposed of at auction at prices said to be satisfactory considering business conditions.

Small Lists Stimulate Trade

PITTSBURGH, July 12.—Issuance of a few fair sized inquiries for machine tools have had a more or less stimulating effect upon the trade here although it cannot be said that the market shows much real improvement. The Knickerbocker Fuel Co., Johnstown, Pa., has issued a small list of machine tools, including a wheel press, shaper, drill, lathe, etc. The International Nickel Co., Huntington, W. Va., has put out what is thought to be only a partial list of its machine tool requirements, covering a crank shaper, plain shaper, planer, radial drill, cold saw, etc. A small list from a coal mine repair shop likewise is before sellers here. Most of the other inquiries current, however, call for single items and small sales only are reported.

One seller disposed of a 2000-ton press to one of the local steel companies, while a bulldozer was sold for shipment South. Another steel company in this district, through its mechanical superintendent negotiated for a $5000 press but because he could not get the appropriation approved, the purchase will not be made at this time. A Virginia foundry has purchased a complete foundry equipment lay-out from the J. S. McCormick Co., this city, including a cupola with lining, two crane and buggy ladles, core ovens, core machine, motor-driven blower, sand mixer and air compressor, two exhaust tumbling mills and an embossing press for pattern letters together with pneumatic tools, supplies, etc.

Gear hobbers, etc., probably will be purchased at an early date by the Schmick Gear & Screw Co., Williamsport, Pa., which is erecting a building. Automatic pumps, etc., are to be manufactured by the Correct Measure Co., Rochester, Pa., recently incorporated at $50,000 and it likely will purchase some equipment at an early date.

Crane sellers report the situation more quiet, with fewer inquiries before them than ever before. Efforts to close up projects which have been hanging fire for a long time have not resulted successfully; everybody is waiting and holding up contemplated expansions, postponing the necessity for ordering crane equipment. The Pittsburgh Screw & Bolt Co., however, has closed upon a 2-cubic yard grab bucket monorail hoist and a 5-ton case-controlled monorail hoist, the order going to the Shepard Electric Crane & Hoist Co. The Wheeling Steel Corp. has not closed as yet on its two cranes, one each 5 and 7½ tons.

Small Buyers Predominate

CHICAGO, July 12.—Most dealers report declining activity in the machine tool market, although there are indications of a slight increase in sales of small tools. One of the largest dealers reports having maintained sales on an average of two tools a week for several months. Another dealer handling mostly large equipment states that his salesmen in covering the field find over half the plants visited closed down for the month. It is the small machine shop or manufacturer who is in the market today. Specialty devices for automobiles have caused the purchase of several machines. Tools somewhat out of the usual run are moving faster than the standard shapers, planers and lathes. Such tools as centerless grinders and thread millers are in fair demand. One dealer handling die grinders and threading machines reports a fairly consistent increase in business since June 1, June itself being his best month of the year. One feature of the present situation is the necessity for more liberal financing. Small plants need more credit than the large plants which were buying a year ago. The result is that dealers are getting more paper, trade acceptances, etc., and correspondingly less actual cash. The result is embarrassing for many of the dealers. During the week the Star Tool Co. and the Blanche Twist Drill & Tool Co. sold their entire equipment at public auction. The sales were not well attended and the prices generally were low. At the Star Tool Co. sale only one dealer was present. Most of the tools went to the International Tool & Engineering Co., Chicago, manufacturer of dies and die machinery. Sunderland & Co., Chicago, are to sell a stock of 26 tools during the coming week, and announces the removal of the plant to Warsaw, Ind. No new railroad lists have come out recently.

Believe Upturn Is Not Distant

CLEVELAND, July 12.—While numerous inquiries are being received by dealers in machinery and machine tools in this district, the aggregate is not sizable, nor does it reflect any increased industrial activity. Sales of both new and used tools and machinery are reported but they also are in single or small lots, the aggregate being small. Two exceptional sales were made by one dealer here last week, one lot of 18 machines for the federal board of vocational training at Valparaiso university, Valparaiso, Ind., totaling $16,000, while the other was $13,000 worth of contractors' supplies.

The federal board's purchase was composed entirely of used tools, rated about 80 per cent. It brought out some keen competition, the successful bid being only a few dollars under the next lowest figure submitted. The total of all bids submitted was approximately $400,000. The lot included planers, milling machines, cylindrical grinders, internal grinders, lathes and shapers. The successful bidder was the A. M. Pattison Supply Co., Cleveland.

This company also sold two motor-driven lathes to the government and among other equipment disposed of was a power brake, a 6-foot radial drill and a lot of small tools.

The government, which has had pending for some time an inquiry for $20,000 worth of assorted machinery and tools, is expected to close some time this week, according to a dealer who has been active in his efforts to land the business. In addition, several private lists are expected to close. These include several inquiries of $3000 to $5000 each and are mostly for new equipment.

Intention of the Ellwood Foundry & Machine Co., Ellwood City, Pa., to buy some machine tools, molding machinery and woodworking machinery, is attracting some attention here. The company, while not specifying its actual needs, recently was reorganized with $75,000 capitalization and expects to acquire a 50 x 200 steel building and a 5-ton overhead electric traveling crane.

Dealers expect the last half of the year to be better than the first, the trend of the past few weeks leading some to the belief the upturn is not far distant. Conservative dealers are not expecting any perceptible increase until fall, perhaps around Oct. 1, although in the meanwhile with inquiries continuing as they are, the absolute dearth of sales which has prevailed is expected to give way to a little more general activity.

Weather Affects Canadian Market

TORONTO, Ont., July 12.—The demand for machinery and machine tools again is falling off. Inquiries for the week were smaller than usual and sales were correspondingly limited. The Canadian railways and the automobile industry have been out of the market for some

time and in addition practically all other industries have been working on short time with plants below capacity.

The construction of new industrial plants is much below the average of other years. The uncertainty of trade conditions for the present is causing manufacturers who have been contemplating enlargements to put off building until more favorable conditions arise and on this account machinery and tool dealers in Canada do not look for a revival in active business for some months to come.

H. Pelandeau, Ltd., 1211 Ontario street, Montreal, is in the market for complete planing mill equipment. W. Mahoney, 162 Anger street, Montreal, is in the market for two lathes and other machine shop equipment. R. C. Desrochers, secretary, department of public works, Dominion government, Ottawa, Ont., will receive bids until July 22 for the supply and installation of an oil engine and generator in power house at William Head, B. C. J. D. Robertson, deputy minister, department of public works, Provincial Government, Edmonton, Alta., is receivings bids for the construction of power house at Calgary, Alta., to cost $150,000, for which equipment will be purchased at an early date.

Electrical Industry Grows Three-Fold since 1914

WASHINGTON, July 11.—A preliminary statement of the 1920 census of manufactures with reference to the manufacturing of electrical machinery and apparatus has been issued by the bureau of the census, department of commerce. This report lists manufacturers during 1919.

The figures are based upon the returns from 1404 establishments, with products valued at $993,280,000. In addition, electrical machinery and apparatus to the value of $21,093,000 were produced as subsidiary products by 79 establishments in other lines of manufacture, making a total value of $1,014,373,000. In the census of 1914 there were 1030 establishments with products valued at $335,170,000 and 91 establishments with subsidiary electrical machinery and apparatus to the value of $24,262,000, a total of $335,170,000.

There is, however, a considerable production of such commodities by establishments engaged primarily in other lines of manufacture, and the general statistics for them are included with those for other branches of industry.

The comparative statistics for 1919 and 1914 are summarized in the following statement. The figures for 1919 are preliminary and subject to such changes and corrections as may be necessary upon a further examination of the original reports.

	1919	1914
Number of establishments	1,483	1,121
Value of products (1)	$1,014,373,000	$359,432,000
Generating apparatus and parts:		
Direct current	13,142,000(2)	.....
Alternating current	13,127,000(2)	.....
Small dynamos	29,704,000(2)	23,233,000
Self-contained lighting outfits	24,079,000(2)	.....
Parts and supplies	6,214,000(2)	.....
Transformers and feeder potential regulators	31,691,000	13,120,000
Rheostats, controllers and resistances	21,542,000	9,543,000
Generator voltage regulators	262,000	245,000
Motors (not including starters or controllers)	116,898,000	44,176,000
Electric locomotives	8,161,000	3,721,000
Batteries, storage, dry, and liquid	92,506,000	23,402,000
Carbons, lighting, furnace, and brushes	13,292,000	3,603,000
Arc lamps, carbon, and luminous	607,000	742,000
Searchlights, projectors, and focusing lamps	4,342,000	2,082,000
Incandescent lamps, tungsten, carbon and other	59,372,000	17,350,000
Rectifying apparatus	1,965,000	148,000
Telegraph apparatus, intelligence, police, and radio	12,816,000	2,248,000
Telephone apparatus	46,340,000	22,816,000
Apparatus and devices, industrial, and household	54,998,000	4,049,000
Electric measuring instruments	19,322,000	8,786,000
Magneto-ignition apparatus, generators, spark-plugs, and coils	47,389,000	22,261,000
Miscellaneous electrical machinery, apparatus, and supplies:		
Switchboards, panel boards and cut-out cabinets for light and power	17,736,000	8,989,000
Railway switches, signals, and attachments	$4,467,000	$6,394,000
Circuit breakers (oil, carbon and air)	4,370,000(3)	.....
[illegible]	[illegible]	[illegible]
Insulators	6,504,000(3)	.....
Sockets, receptacles, bases and attachment plugs	15,636,000	5,513,000
Wiring supplies (current carrier)	6,858,000(4)	.....
Lighting arresters, choke coils, reactors and other protective devices	2,353,000	1,189,000
Insulated wire and cables	84,217,000	69,506,000
[illegible]	[illegible] (5)	.....
Circuit fittings, not elsewhere provided for	4,908,000	2,068,000
Conduits, underground and interior	19,267,000	4,875,000
Electric lighting fixtures of all kinds	2,718,000	3,384,000
Annunciators and push buttons	710,000	264,000
Electric clocks and time mechanisms	1,798,000	411,000
Bells, buzzers and signal gongs	3,616,000(6)	.....
Therapeutic apparatus	5,482,000	2,653,000
X-ray tubes	3,389,000(3)	.....
All other electrical machinery and apparatus	74,898,000	27,276,000
All other products	89,643,000	23,628,000
Amount received for custom work and repairing	30,760,000(3)	.....

(1) Includes electrical machinery and apparatus valued at $21,093,000 reported as subsidiary products by 79 establishments engaged primarily in other industries in 1919, compared with $24,262,000 by 91 establishments in 1914.
(2) Included with dynamos in 1914.
(3) Included with all other electrical machinery in 1914.
(4) Included with electric light fixtures in 1914.
(5) Included with circuit fittings in 1914.
(6) Included with annunciators in 1914.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

ANSONIA, CONN.—Bids will close July 15 for a brick, 2-story, 60 x 200-foot factory for the Ansonia Electrical Co.

BIRMINGHAM, ALA.—The Birmingham Canning Machinery Co., which was recently organized, plans to establish a plant here for the manufacture of machinery and parts.

BRIDGEPORT, CONN.—The Pharo Mfg. Co. has increased its capital stock from $150,000 to $250,000.

BRIDGEPORT, CONN.—The Crane Co. has let the contract for the erection of a

steel, 82 x 300-foot monitor type roof to cost $25,000 on one of its factories.

MILFORD, CONN.—The Rostand Mfg. Corp., maker of brass and bronze goods, has changed its name to the Rostand Mfg. Co.

MILFORD, CONN.—The W. F. Concannon Shear Co. has been incorporated to make cutlery with $30,000 capital by Donald Page, E. L. Oviatt and E. L. Nettleton.

MYSTIC, CONN.—Contract has been awarded for the erection of a steel highway bridge over the Mystic river at a cost of $100,000.

NEW BRITAIN, CONN.—The Malleable Iron Works is to erect a brick 38 x 38-foot addition.

NEW HAVEN, CONN.—The Connecticut Metal Bed Co. has been incorporated with $25,000 capital by Pietro D' Antonio, Arturo Martino and C. E. Tester.

NEW HAVEN, CONN.—The Economy Electrical Mfg. Co. has been incorporated with $25,000 capital by A. I. Lapides, S. D. Pardoll and Sol Jacobson.

NEW HAVEN, CONN.—The Two-In-One Signal Lamp Corp., with $50,000 capital has been incorporated to make automobile accessories, by J. M. Chapnick, I. Fine, Leon Marcus, Brooklyn, N. Y., and Maurice Levin, New York.

STAMFORD, CONN.—An incendiary fire caused $25,000 damage to the plant of the H. & H. Foundry & Machine Co.

STAMFORD, CONN.—Contract for a $30,000 garage has been awarded to W. J. O'Brien. The proposed structure will be 1-story high, 75 x 110 feet.

BELLEVILLE, ILL.—The St. Clair Foundry Corp. has been incorporated by Richard D. Wiechart and Frank C. Wiechart with $100,000 authorized capitalization.

CHICAGO—The Acme Motion Picture Projector Co., 1134 West Austin avenue, plans a 3-story factory building.

CHICAGO—The Sheet Metal Construction Co., 2019 Laflin street, has let a contract for a 2-story shop building, 50 x 80 feet, to cost about $20,000.

CHICAGO—The manufacture of vending and similar machines and specialties is to be undertaken by the Chicago Vending & Specialty Co., 1407 West Taylor street, Chicago, which recently was incorporated for $10,000 by Gustave Borger, Abe Shirtke, and James F. Collins.

CHICAGO—The Motor Parts Corp., 130 North Wells street, capitalized with 100 shares of no par value, recently was chartered to manufacture and sell automobiles, motor cars, parts, etc. The incorporators were P. L. Nelson, Warren B. Buckley and Walter H. Eckert.

CHICAGO—The manufacture and sale of blow torches, plumbers' furnaces, etc., is the purpose of the Shields Sales Co., 215 North Michigan avenue, which recently was chartered with $20,000 authorized capitalization by Brooke Anderson, Anson C. Morgan, and Samuel S. Shields.

CHICAGO—Capitalized at $2500, the Gurney & Selleck Co., the Peoples Gas building, 122 Michigan boulevard, has been organized and chartered to manufacture and deal in furnace and other equipment for the treatment of steel. The incorporators include Theodore G. Selleck and Richard Keith Gurney.

CHICAGO—Frank Starns & Sons, Inc., room 1473 at 5 North Halsted street, will manufacture and distribute sheet metal roofing, according to terms of incorporation recently filed. The company is capitalized at $100,000. The incorporators include W. R. Beckman, Albert O. Olson, and L. M. Betts.

CHICAGO—The Steam Boiler Equipment Co., 53 West Jackson Boulevard has been incorporated with $5000 authorized capital to manufacture and deal in foundry, power plant, furnace equipment, etc. The incorporators include B. R. Page, F. C. Corley, F. L. Page and William D. Shepherd, 815 First Bank building.

GREENVILLE, ILL.—The Duty Moto-Corp. plans to enlarge its facilities by the erection of a building, 250 x 250 feet.

ANGOLA, IND.—The Electric Safety Equipment Co. has been incorporated with $25,000 capital stock to manufacture electrical equipment, etc. by J. B. Fitch, H. G. MacLellan and E. A. Skinner.

TERRE HAUTE, IND.—Coats Steamers, Inc., has been incorporated with $5,000, capital stock, by Earl R. Cox, W. S. McCloud, Terre Haute, and Louis Clements, Danville, Ill., to manufacture steam-driven automobiles.

CALAIS, ME.—The Maine Central railroad has let the contract for the erection of a brick, 1-story round house and a 50 x 215-foot repair shop to replace those recently destroyed by fire.

GREENVILLE JUNCTION, ME.—The Great Northern Paper Co. is to erect a reinforced concrete, fireproof 1-story and basement 100 x 215-foot machine shop.

BALTIMORE—A $50,000 service and repair plant will be erected by the Ogden Bros. Motor Co.

BALTIMORE—The Victor Piston Ring Co. has been incorporated with $500,000 capital stock, by George D. F. Robinson, F. Pyrce and E. A. Leiby, to manufacture piston rings, automobile accessories, etc.

BOSTON—The Lunt-Moss Corp. has been incorporated with $50,000 capital stock to manufacture tools and machinery, by James W. Moss, 43 South Market street, and others.

BOSTON—The Hygienic Coin Lock Co. has been incorporated with $100,000 capital by Isaac J. Segal and Philip I. Holmes, both of Malden, Mass., and Lester G. Barrett, Cambridge, Mass.

BOSTON—The Daniels Mfg. Co. has been incorporated to make automobile accessories, etc., with $800,000 capital by Harry L. Donahue, Charles T. Mackay and Edwin T. Giblin.

BOSTON—The Hartwell-Lester Coal Export Corp., New York, has been incorporated with $50,000 capital by Swan Hartwell and Harry N. Matthews, both of Newton, Mass., and Charles E. Lester, Freeport, L. I., N. Y.

BOSTON—The George F. Croak Foundry Co. has been incorporated with $25,000 capital by George F. Croak and Gerald M. Croak, both of Athol, Mass., and Winthrop I. Pottage, Medford, Mass. It has purchased the foundry of the M. P. Brundige Co., Inc., in the Dorchester district.

BROCKTON, MASS.—Hamblin Brothers, Inc., has been incorporated at $100,000 to build motors. John C. Makepeace, Wareham, Mass., William F. Makepeace, West Barnstable, Mass., Wendell P. Hamblin, Providence, R. I., Edson E. Hamblin, Falmouth, Mass., and Thomas Otis, Hyannis, Mass., are the incorporators.

MALDEN, MASS.—The Converse Tire Co. has been incorporated to build automobiles and make supplies with $1,000,000 capital by Marquis M. Converse, Hugh Bullock and Frank R. Goodell, Andover, Mass., and others.

MILLBURY, MASS.—The Richard French Iron Works, Worcester, Mass., is having plans made for a steel, 1-story, 50 x 120-foot foundry and other buildings for a new plant here. It has sold its property in Worcester to the Arcade Malleable Iron Co.

NEW BEDFORD, MASS.—The Sethford Mfg. Corp. has been incorporated to build engines and machinery with $50,000 capital by S. M. Cabral, Edmund Amaral and Lionel A. Dias.

NORTHAMPTON, MASS.—The William E. Quinn Co. with $50,000 capital has been incorporated to build machinery and make tools by David W. Long, Harry M. Chamberlain, Shelburne, Mass., William E. Quinn and Albert G. Beckman.

NORTHBORO, MASS.—The New England Chair & Furnace Mfg. Corp., has been incorporated to build automobile bodies with $50,000 capital by Willis A. Perkins, Max Katz and Solomon Stayman, all of Worcester, Mass.

SPRINGFIELD, MASS.—Allis Freedman plans to erect a brick, 1-story machine shop on Church street.

ALPENA, MICH.—George F. Snyder, Inc., has been incorporated with $50,000 capital stock, by George F. Snyder and Samuel Taig, to manufacture aluminum, brass, bronze and other metal castings.

DETROIT—The Detroit Alloy Steel Co. has been incorporated with $50,000 capital stock, by Frank L. Griffin, Robert H. Hall and John Grant, 1938 Taylor avenue, to manufacture alloy steel products.

LUDINGTON, MICH.—The Ludington Novelty Co. has been incorporated with $20,000 capital stock, by L. E. Vorse, William C. Killean and Bernard Ostendorf to manufacture steel needles, etc.

ASBURY PARK, N. J.—The King Tool Co. has been incorporated with $100,000 capital stock, by A. C. Klopper, Joseph Pilling and Joseph C. Tynan, Mattison avenue, to manufacture tools and mechanical products.

BOUND BROOK, N. J.—The Automatic Coin Change & Record Machine Co., with $1,000,000 authorized capitalization, recently was incorporated by Irwin J. Palmer, Jeremiah J. Regan and Fred A. Frobose.

ELIZABETH, N. J.—The Arny Steel Construction Co. has been incorporated at $75,000 by Charles Arny, John F. Arny, and John B. Arny.

IRVINGTON, N. J.—Work will be started shortly by the Vreeland Motor Co., on the first unit of its new plant, which is to be designed for the manufacture of motor trucks.

NEWARK, N. J.—Plans have been filed by the Mennen Co., for the erection of a $25,000 garage and warehouse.

NEWARK, N. J.—The Essex Metal Ceiling Co. has been incorporated with $50,000 stock, by George and Aaron Herr, 584 Bergen street, to manufacture metal ceilings, etc.

NEWARK, N. J.—Plans are being prepared for the erection of a $650,000 apartment hotel for the Harry Kruvant Co. Backoff, Jones & Cook are architects.

NEWARK, N. J.—Contracts for another addition to the plant of Joseph Hollander, Inc., have been awarded to Salmond, Scrimshaw & Co., Arlington, N. J. The proposed structure will be 51 x 74 feet.

NEWARK, N. J.—The Universal Caster &

The Hartford Times is another one of those old-established newspapers in the manufacturing districts of New England which quote The Iron Trade Review. The Times was founded in 1841; its prestige is second to none in Connecticut.

The Iron Trade Review says:
"Although a mild undercurrent of optimism prevails among steel makers, it is difficult to attribute it to any single factor. Slight encouragement is gained from the volume of new business, which is almost entirely composed of orders for carload or less than carload lots."

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PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

Foundry Co., the Newark branch of the Esick Co., Bridgeport, Conn., has leased the lower portion of a building at 135 Jackson street. Some alterations will be made.

PLAINFIELD, N. J.—The Kerwin Mfg. Co. has been incorporated with $25,000 capital stock, by Charles T. Woodruff, William B. Mead and Lawrence Kerwin, Rock avenue, to manufacture universal joints, etc.

BROOKLYN—The Butler Kwik Lift Co., to manufacture garage equipment, recently was incorporated with $50,000 capital authorized. L. Scherer, 38 Park Row, was the incorporating attorney.

BUFFALO—The Buffalo Shock Absorber Co. has been incorporated with $50,000 capital stock to manufacture shock absorbers. Frank A. Abbott, Iroquois building, represents the company.

NEW YORK—A power plant addition will be erected by the New York Edison Co., 130 East Fifteenth street.

NEW YORK—A plant addition will be erected on East 132nd street by the A. C. Shesley Co., 227 Ryder avenue.

NEW YORK—The New Amsterdam Gas Co., 132 East Fifteenth street, plans a switching plant, 63 x 94 feet, to cost about $125,000.

NEW YORK—A. J. Schwanzler will build a $120,000 garage. According to plans by S. W. Kissler, 529 Cortland avenue, the proposed structure will be one and four stories high, 85 x 200 feet, and 85 x 100 feet.

NEW YORK—Samuel E. Bernstein, Inc., has been incorporated with $300,000 capital stock, by P. J. M. and Samuel E. Bernstein, 106 Fifth avenue, to manufacture cutlery, etc.

NEW YORK—The Kimbro-Rayburn Corp. has been incorporated with $225,000 capital stock, by J. W. Kimbro, S. C. Berry and J. Hennies to manufacture lawn mowers, etc. It is represented by T. F. VonDorn, 141 Broadway.

ROCHESTER, N. Y.—The Stay New Filter Corp. has been incorporated with $100,000 capital stock, by W. F. and L. L. Dollinger and J. J. McInerney, Insurance building, to manufacture air filters for automobile service.

SYRACUSE, N. Y.—The Service Parts Co. has been organized by G. K. Sutphen and F. H. Spangle, Fulton, N. Y., to manufacture automobile parts.

WILMINGTON, N. C.—The Broadfoot Iron Works recently was destroyed by fire, the loss being estimated at $150,000, including stock and supplies. W. G. Broadfoot, president, said the loss was partly covered by insurance.

AMHERST, O.—The National Razor Mfg. Co., Fremont, O., is preparing to move the company's plant to this place.

CINCINNATI—The Grant Machine Co. has leased a warehouse at 1423 Plum street.

CINCINNATI—The Venus Phonograph & Needle Co., capitalized at $20,000, has been incorporated by Frank Herringer, Frank L. Gamel, Joseph W. K. Silver and others.

CINCINNATI—Capitalized at $10,000, the New Process Tire Machine Co. has been chartered and organized by William J. Powell, A. Nelson Pope, Joseph J. Wicke and others.

CINCINNATI—The V. & P. Vacuum Co. has been incorporated with $25,000 capital stock to manufacture automobile vacuum systems, by Frank J. Zumstein, W. P. Anderson and others.

CLEVELAND—The Pioneer Electrical Supply Co. of this city has been incorporated with $10,000 authorized capitalization by Morris Berick and Joseph Posner.

CLEVELAND—Capitalized at $10,000, the Andrews Paint & Hardware Co., recently was incorporated by A. V. Andrews and D. V. Hopkins.

CLEVELAND—The J. T. Tractor Co. has leased to the Morse-Rogers Steel Co. a warehouse and one and a half acres of land on Fairfield avenue.

CLEVELAND—The Interlake Engineering Co., Cuyahoga river and Jefferson avenue bridge, has bought land with 295 feet frontage on the river for use in connection with its shipbuilding plant.

CLEVELAND—The Sterling Brass Mfg. Co., 4612 St. Clair avenue, plans construction of a reinforced concrete foundry and machine shop containing 31,000 square feet and costing $100,000. Allen Sogg, Hippodrome building, is the architect.

COLUMBUS, O.—The Ohio Heater Co., with $30,000 capital authorized, has been incorporated by J. L. Reed, R. W. Laylin, L. F. Laylin, Clarence D. Laylin and C. H. Boardman.

HAMILTON, O.—Joseph E. Fisher and Wilbur Black are among the incorporators of the Fisher Lock Co., recently organized with $50,000 authorized capitalization.

LANCASTER, O.—The Doid Kerns Heating & Roofing Co., capitalized at $25,000, recently was chartered by Doid Kerns, Gail B. Kerns, Joseph M. Smith and others.

SANDUSKY, O.—The United States court at Toledo has given the receivership operating the Erie Tire & Rubber Co. permission to spend $32,000 to complete and equip buildings here.

CHESTER, PA.—Bids will be closed July 12 on the erection of a main building and power house for the Saint James Mercy hospital.

ERIE, PA.—The Keystone Rubber Mfg. Co., 141-3 East Eleventh street plans to rebuild plant which was recently damaged by fire.

JEANNETTE, PA.—George R. West & Sons is being organized to operate a plant here for the manufacture of iron and glass products.

JOHNSTOWN, PA.—The Johnstown Steel Car & Supply Co. has been incorporated with $600,000 capital stock, by H. H. Thompson, I. Schermin and H. Earl Sorber, to manufacture mine car wheels, etc.

PHILADELPHIA—The J. W. Paxson Co. will start work shortly upon two plant additions, costing $50,000.

PHILADELPHIA—A $100,000 garage will be erected by C. E. Abeel. The proposed structure will be one and two stories high, 150 x 200 feet.

PHILADELPHIA—A $15,000 boiler house addition will be erected by the Pennsylvania Sugar Co. The O'Meara Construction Co. has been awarded the general contract.

PHILADELPHIA—The Robbins Contracting Co. has received a contract for the erection of a coal trestle for M. B. Schubin, Clark & Dudnick, are architects in charge.

PHILADELPHIA—Plans are being prepared by Paul A. Davis, architect of this city, for a chemical building, costing $400,000, and a physical education building, costing $300,000, for West Virginia university, Morgantown, W. Va.

PHILADELPHIA—The Paul E. Flotron Co. has been incorporated with $50,000 capital stock to manufacture ice-making and refrigerating machinery, by Paul E. Flotron, 207 North Thirty-fifth street and others.

PITTSBURGH—The Duquesne Wire Rope Co. has acquired property, 64 x 81 feet, on which it plans a building.

PITTSBURGH—The De Vassie, Beedle & Duffey Automotive Grinding is being organized by H. M. Vassie, William B. Duffey and E. T. Beedle, to operate a general machine works. A. L. Zeman, 596 Union Arcade building, represents the company.

PITTSBURGH—The Hawkins Traction Flange Co. is being organized by Albert C. and Anthony J. Pauley and M. J. Koch, to manufacture flanges for traction wheels. R. H. Frank, 503 Farmers Bank building, represents the company.

POTTSVILLE, PA.—F. W. Van Loom has been awarded the general contract for the erection of a $250,000 building for the Safe Deposit Bank. Alfred Hopkins, New York, is architect.

WILKESBARRE, PA.—A $25,000 garage will be erected here by Smith & Clarke Co.

PAWTUCKET, R. I.—The machine and annealing shops of the J. D. Crosby Co., fabricator of steel, were recently destroyed by fire with a loss of $60,000. They will be rebuilt.

PROVIDENCE, R. I.—A $30,000 garage, 1-story high, 50 x 100 feet, will be erected here by A. J. Martin.

KNOXVILLE, TENN.—The Combined Grate & Radiator Heating Co. was recently incorporated with $30,000 capital stock, an will operate a plant at Fountain City, Tenn. Organizers of the company are H. E. Kell, W. E. De Armond and others.

CHARLESTON, W. VA.—A charter was issued to the Ralph E. Garrity Co., Wheeling, W. Va., with $5000 capital stock, to deal in machinery, the incorporators being R. E. Garrity, A. O. Garrity, M. S. Wasserman, F. K. Hutle, all of Pittsburgh, and J. E. Rodge and W. H. Gold of Wheeling.

FAIRMONT, W. VA.—Work has been begun by A. B. Knight on an addition to his machine shops in East Park avenue.

FAIRMONT, W. VA.—With $40,000 authorized capitalization, the Marion Motors Co. recently was organized and chartered by L. G. Roop, J. B. Moore, J. R. Cole and others.

KENOVA, W. VA.—The Tri-State Equipment & Repair Co., capitalized at $50,000, to operate a machine shop and garage, has been incorporated by W. D. Sutton, S. C. Otis, and A. S. Glenn, all of Ashland, Ky., and H. M. Robinson and J. W. Hevner, both of Huntington, W. Va.

NITRO, W. VA.—The Nitro Foundry Co., with $50,000 authorized capitalization, has been incorporated by M. S. Aldrich, Ralph Matthews, W. A. O'Neill and others, all of the Charleston, W. Va.

WHEELING, W. VA.—The United States engineer's office, Federal building, will receive until July 27 bids for two double 12-room lockhouses for two government dams in the Wheeling district.

APPLETON, WIS.—The C. R. Meyer & Sons Co., Oskosh, Wis., has been awarded the contract for the erection of a new St. Elizabeth's Hospital, with boiler house and power plant, at a bid of $384,000, which does not include heating, plumbing or electrical work. Sister M. Callista is secretary.

BARRON, WIS.—A machine shop, 60 x 100 feet, and a forge and blacksmith shop, 30 x 45 feet, will be built by the Barron county board

of supervisors for the care and maintenance of its highway construction machinery.

BAYFIELD, WIS.—Henry Fiege has purchased the interest of Arthur Fiege in Fiege Bros., automobile dealers and repairmen, and will build a 1-story brick addition, 30 x 100 feet, for machine shop purposes, and a salesroom addition, 50 x 90 feet.

EAU CLAIRE, WIS.—Articles of incorporation have been filed by the Apex Auto Accessory Co., which is chartered to manufacture and deal in automobile parts, devices and equipment. The capital stock is $10,000 and the incorporators are Ralph P. Jones, William H. Griffin and C. M. Olson.

EDEN, WIS.—W. J. Nast and associates have organized a $75,000 corporation to capitalize the output of a mineral spring at Eden. A bottling plant and shipping room, 60 x 100 feet, will be erected and equipped with new machinery.

MANITOWOC, WIS.—Architects Juul, Smith & Reynolds are taking bids for the erection of a fireproof garage and machine shop, 60 x 120 feet, part 2-story, for the W. C. Dicke Motor Co. It will cost about $20,000 equipped.

MASON, WIS.—Hegstrom Bros., automobile dealers and repairers, will build a 1-story fireproof garage and machine shop, 46 x 112 feet, with part basement, estimated to cost $18,500.

MILWAUKEE—The National Rag & Paper Co. has been incorporated with a capital stock of $20,000 by A. Shapiro, L. B. Shapiro and Morbeus Shapiro, to deal in waste metals, junk, rags, paper, etc.

MILWAUKEE—The Mehan Mfg. Co., farm lighting systems, has selected Jackson, Wis., as the location of its permanent works. The corporate title has been changed to the Jackson Light Mfg. Co.

MILWAUKEE—The fire department accepted the bid of the S. Heller Elevator Co. to build and install a new electric freight elevator in the station at 268 Virginia street at a price of $2454.

MILWAUKEE—The More Power Spark Plug Co., capital stock $200,000, has been incorporated by Roy G. Hale, August Haberer and Edwin Krenzel, with temporary headquarters at 889 Thirty-ninth street. It will open a shop for manufacturing spark plugs and other metal devices for gas engines.

MILWAUKEE—Members of the Milwaukee Concrete Mixer Co., 955 Thirteen street, Milwaukee, are the incorporators of a new concern, known as the Sphinx Machine Co., organized with a capital stock of $75,000 to manufacture ice and refrigerating machinery, ice boxes, etc. It will specialize in small units for the home, operated by electric motors. The incorporators are W. F. Teschan, F. C. Schroeder, H. J. Krueger and H. W. Rottel.

OCONOMOWOC, WIS.—Bids for the construction of a new high school and vocational training institute, 132 x 187 feet, 2-story and basement, are being taken by E. K. White, clerk of the board of education. The project is in charge of Architects Parkinson & Dockendorff, LaCrosse, Wis. It will cost about $225,000.

OSHKOSH, WIS.—The Hollister Auto Co. will build a new garage and machine shop of brick and steel, 80 x 120 feet, 1-story, at Algoma boulevard and Bond street. The general contract has been let to the C. R. Meyer & Sons Co., this city.

PORT WASHINGTON, WIS.—Pouring and lifting devices, cranes, hoists, etc., will be manufactured by the Modern Pouring Device Co., which has been organized by Max Goldberg, M. J. Knappe and Norman E. Hinze, all of this city. The capital stock consists of $25,000 preferred and $25,000 common stock.

RACINE, WIS.—The Sterling Metal Products Co. suffered a loss of about $16,000 by fire which badly damaged its building and equipment. The insurance amonts to $8000. The company intends to resume manufacturing in temporary quarters pending repairs.

RACINE, WIS.—The business of the McAvoy Mfg. Co., builder of automobile tops, winter tops, curtains and automobile bodies, has been incorporated under the name of the Wisconsin Top Co., Inc., with a capital stock of $300,000. The incorporators are C. V. McAvoy, L. M. Johnston and O. M. Kalmeliano.

SHEBOYGAN, WIS.—An ordinance authorizing a bond issue of $200,000 for the construction of a new bascule span across the Sheboygan river has been adopted by the common council of Sheboygan, Wis., Klug & Smith, Mack block, Milwaukee, consulting engineers, were engaged some time ago to prepare plans. The bonds are now being marketed.

STEVENS POINT, WIS.—The Farmers Tractor Corp., originally organized at Oshkosh, Wis., has decided to build its works at Stevens Point and has moved its headquarters to this city. A. J. Patch is vice president and chief engineer. Work on a machine shop and assembling floor is to be started about Sept. 1.

WAUPACA, WIS.—Some additional machine tool equipment is being installed by the Jorgenson Mfg. Co., operating a large brass foundry and machine shop for the manufacture of priming devices and other brass parts and products for the automobile industry.

WAUSAU, WIS.—An increase of about 35 per cent in capacity is planned by the Marathon Electric Mfg. Co., maker of small electric motor devices and appliances. Architects Oppenheimer & Obel are preparing designs for a 1-story brick and steel shop addition, 40 x 180 feet.

West of the Mississippi

LOS ANGELES—The Standard Sheet Metal Works, 310 East Ninth street, has been organized to manufacture metal specialties, etc. by F. W. Roberts, 1477 West Forty-fifth street, and others.

OAKLAND, CAL.—A building at the plant of the Moore Shipbuilding Co. recently was damaged by fire.

LECLAIRE, IOWA.—The Lorenzen Mower Co. has broken ground for a factory building, 60 x 120 feet.

HELENA, MONT.—Completion of arrangements for the construction during the summer of a steel bridge across Clark's fork of the Columbia river at Noxon, Sanders county, has been announced by the State Highway Commission. Estimates of cost run from $140,000 to $150,000. There will be three 200-foot spans.

PORTLAND, ORE.—The Robins Machine Co., this city, has been incorporated by G. F. Robins and others, with $50,000 authorized capitalization.

CENTRALIA, WASH.—Erection of a $75,000 light plant has been authorized.

SPOKANE, WASH.—Orders directing to erect a sewage disposal plant at an estimated cost of $1,000,000 may be expected from Dr. Paul A. Turner state director of public health at any time following his recent declaration that he will take the municipality into court if it does not erect a disposal plant.

Business in Canada

VICTORIA, B. C.—The steel contract for the carbonizing plant to cost $125,000 for the Victoria Gas Co., 1016 Langley street, has been awarded to the Foreshore Steel Co., Vancouver, B. C.

WINNIPEG, MAN.—The Woolston Automatic Binder Knotter Co., Ltd., has been incorporated to manufacture farm implements, machinery, tools etc., with $50,000 capital stock, by Albert C. Ferguson, David Wilson, Walter F. Pickersgill and others.

GUELPH, ONT.—The Lumber mill owned by the Robert Stewart Lumber Co., Wyndham street, was destroyed by fire with a loss of $200,000 to building and equipment. It is expected the factory will be rebuilt.

HAMILTON, ONT.—The Ace Chain, Ltd., has been incorporated with $200,000 capital to manufacture chains, automobile equipment, etc., by Cecil V. Langs, Ewart G. Binkley, Howard Morwick and others.

PARIS, ONT.—The Bishop-Blaney Corp., Ltd., has been incorporated to carry on business as iron founders, manufacturers of machinery, brass, copper, metals, forgings boilers, etc., with $5,000,000 capital stock, by Arthur W. Clysdale, Roland M. Clover, Berty W. Manning and others.

TORONTO, ONT.—The Canuck Tool Mfg. Co., Ltd., has been incorporated with $40,000 capital to manufacture machinery, tools, implements, etc., by Summer W. Graham, 62 Richmond street west; Percy C. Innes and others.

TORONTO, ONT.—The Sani Products Co., Ltd., has been incorporated with $40,000 capital to manufacture iron, steel, metal and wood products, hardware, etc., by John S. Duggan, 114 Kendal avenue; Willis B. Sturrup, 6 Adelaide street east, and others.

TORONTO, ONT.—The Continental Electric Co., Ltd., has been incorporated with $40,000 capital to manufacture electrical appliances, machinery, tools, equipment, etc., by Molyneaux L. Gordon, 6 Adelaide street east; Craig A. S. McKay, 450 Walmer road, and others of Toronto.

MONTREAL, QUE.—The Standard Paper Box Co., 8 St. Paul street, east, is erecting a factory here to cost $200,000.

MONTREAL, QUE.—The Woods Mfg. Co., 800 Mullin street, will build a factory addition to cost $60,000.

MONTREAL, QUE.—The Canadian Benedict Stone, Ltd., has been incorporated with $230,000 capital to manufacture artificial stone, brick, tile, etc., by Chilion G. Heward, Herbert W. Shearer, Alfred B. Wright and others.

MONTREAL, QUE.—The Pitt Railways Equipments, Ltd., has been incorporated with $1,000,000 capital to manufacture electrical railway equipment, machinery, tools, appliances, etc., by George L. Alexander, William A. Pitt, both of Montreal; John W. McLeod, New Glasgow, N. S., and others.

MONTREAL, QUE.—The British Empire Steel Products Co., Ltd., has been incorporated with $100,000 capital to manufacture iron, steel, metals, castings, forgings, machinery, tools, implements, etc., by Frederick H. Markey, Waldo W. Skinner, George G. Hyde and others, all of Montreal.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$11.00 to 12.00
Boston (dealers)	6.00 to 6.50
Buffalo	11.00 to 11.50
Chicago	10.50 to 11.00
Cincinnati	8.50 to 9.00
Cleveland	11.00 to 12.00
Detroit (dealers)	7.50 to 8.00
Eastern Pennsylvania	11.00 to 11.50
New York (dealers)	7.00 to 7.50
Pittsburgh	12.00 to 12.50
San Francisco	10.00 to 11.00
St. Louis	10.00 to 10.50
Valleys	12.50 to 13.00

BUNDLED SHEETS

Buffalo	$5.00 to 7.00
Cleveland	5.00 to 5.25
Cincinnati	5.00 to 6.00
Eastern Pennsylvania	8.00 to 8.50
Pittsburgh	7.50 to 8.00
St. Louis	4.00 to 4.50

STEEL RAILS, SHORT

Birmingham	$12.00 to 12.50
Boston (dealers)	7.00 to 8.00
Chicago	11.50 to 12.00
Cincinnati	13.00 to 14.00
Cleveland	10.00 to 11.00
St. Louis	10.50 to 11.00

STOVE PLATE

Birmingham	$11.50 to 12.00
Boston	11.50 to 12.00
Buffalo	12.00 to 13.00
Chicago	13.50 to 14.00
Cincinnati	10.00 to 10.50
Cleveland	13.50 to 14.00
Detroit	12.00 to 12.50
Eastern Pennsylvania	12.50 to 13.50
New York	8.50 to 9.00
Pittsburgh	12.00 to 13.00
St. Louis	10.50 to 11.00

LOW PHOSPHORUS

Buffalo	$15.00 to 16.00
Cincinnati	17.00 to 18.00
Eastern Pennsylvania	16.00 to 17.00
Pitts. billet and bloom crops	15.00 to 15.50

SHOVELING STEEL

Chicago	$10.00 to 10.50
Pittsburgh	8.00 to 8.50
St. Louis	9.00 to 9.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	$11.50 to 12.00
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	13.00 to 13.50
St. Louis	10.50 to 11.00

COMPRESSED SHEETS

Buffalo	$9.00 to 9.50
Chicago	7.50 to 8.00
Pittsburgh	9.00 to 9.50

FROGS, SWITCHES, GUARDS

Chicago	$10.50 to 11.00
Eastern Pennsylvania	10.50 to 11.00
St. Louis	10.00 to 10.50

BOILER PLATE, CUT

Detroit (dealers)	$6.00 to 6.50
St. Louis	6.00 to 6.50

ANGLE BARS—STEEL

Chicago	$11.00 to 11.50
St. Louis	10.00 to 10.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham, No. 1	$11.50 to 12.00
Boston (dealers)	11.00 to 12.00
Buffalo	13.00 to 14.00
Chicago, No. 1	10.00 to 10.50
Chicago, No. 2	10.00 to 10.50
Cincinnati No. 1	8.50 to 9.50
Cleveland, No. 1	13.00 to 13.50
Eastern Pennsylvania, No. 1	14.00 to 15.00
New York, No. 1 (dealers)	11.00 to 11.50
Pittsburgh, No. 1	11.00 to 12.00
Pittsburgh, No. 2	12.00 to 12.50
St. Louis, No. 1	10.00 to 10.50
St. Louis, No. 2	9.50 to 10.00

WROUGHT PIPE

Boston (dealers)	$6.50 to 7.00
Buffalo	9.50 to 10.50
Eastern Pennsylvania	12.00 to 12.50
New York (dealers)	8.00 to 8.50

YARD WROUGHT

Boston	$8.00 to 9.00
Eastern Pennsylvania No. 1	12.00 to 13.00

CITY WROUGHT

New York, long	$9.00 to 9.50

BUSHELING

Buffalo, No. 1	$9.00 to 10.00
Chicago, No. 1	10.00 to 10.50
Chicago, No. 2	7.50 to 8.00
Cincinnati, No. 1	8.50 to 9.50
Cleveland, No. 1	8.00 to 8.50
Cleveland, No. 2	5.50 to 6.00
Eastern Pennsylvania, No. 1	12.50 to 13.00
Pittsburgh	11.50 to 12.00
St. Louis, No. 1	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	$5.00 to 6.00
Boston (dealers)	2.00 to 2.50
Buffalo	5.00 to 6.00
Chicago	3.00 to 4.00
Cincinnati	2.00 to 2.50
Cleveland	6.00 to 6.50
Detroit (dealers)	3.00
Eastern Pennsylvania	8.00 to 8.50
New York (dealers)	3.00 to 3.50
Pittsburgh	7.00 to 7.50
St. Louis	4.00 to 4.50
Valleys	6.50 to 7.00

CAST IRON BORINGS

Birmingham	$5.00 to 6.00
Boston (chemical)	3.50 to 4.00
Boston (dealers)	2.50 to 3.00
Buffalo	5.00 to 6.00
Chicago	5.00 to 5.50
Cincinnati	3.00 to 3.50
Cleveland	7.00 to 7.50
Detroit (dealers)	4.00
Eastern Pennsylvania	9.00 to 9.50
Eastern Pennsylvania (chem.)	10.00 to 11.00
New York (dealers' price)	4.00 to 4.50
Pittsburgh	7.50 to 8.00
St. Louis	7.00 to 7.50
Valleys	10.00 to 10.50

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Boston (dealers)	$2.00 to 2.50
Cleveland	7.50 to 8.00
Eastern Pennsylvania	7.50

IRON AXLES

Birmingham	$21.00 to 22.00
Buffalo	26.00
Chicago	19.00 to 19.50
Cincinnati	17.00 to 17.50
Cleveland	19.50 to 20.50
Detroit	23.00 to 24.00
Eastern Pennsylvania	30.00 to 31.00
New York (dealers)	18.00 to 19.00
Pittsburgh	18.00 to 19.00
St. Louis	17.00 to 17.50

IRON RAILS

Buffalo	$21.00 to 22.00
Chicago	16.50 to 17.00
Cincinnati	13.00 to 14.00
Cleveland	12.50 to 13.00
St. Louis	10.50 to 11.00

PIPES AND FLUES

Chicago	$7.50 to 8.00
Cincinnati	5.00 to 5.50
Cleveland	7.00 to 7.50
Detroit	5.75 to 6.25
St. Louis	6.00 to 6.50

RAILROAD GRATE BARS

Buffalo	9.00 to 10.00
Chicago	$11.50 to 12.00
Cleveland	13.50 to 14.00
Detroit	10.50 to 11.00
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	11.00 to 11.50
St. Louis	7.50 to 8.00

FORGE FLASHINGS

Boston (dealers)	$4.50 to 5.00
Chicago, small	7.50 to 8.00
Cleveland, small	7.25 to 7.75
Cleveland, large	7.50 to 8.00
Detroit (dealers)	4.00

FORGE SCRAP

Boston	$4.50 to 5.00
Chicago	10.00 to 10.50
Eastern Pennsylvania, No. 1	10.00 to 10.50

ARCH BARS AND TRANSOMS

Chicago	$15.50 to 16.00
St. Louis	12.50 to 13.00

ANGLE BARS—IRON

Chicago	$14.50 to 15.00
St. Louis	11.50 to 12.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$3.50 to 4.00
Buffalo	8.00 to 9.00
Chicago	7.50 to 8.00
Cleveland	8.50 to 9.50
Detroit	6.00 to 7.00
Eastern Pennsylvania	9.50 to 10.00
Pittsburgh	9.00 to 9.50
St. Louis	5.00 to 5.50

STEEL CAR AXLES

Birmingham	$14.00 to 15.00
Boston (dealers)	12.00 to 13.00
Buffalo	20.00 to 21.00
Chicago	13.50 to 14.00
Cleveland	18.50 to 19.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	11.50 to 12.00
Pittsburgh	13.50 to 14.00
St. Louis	13.00 to 13.50

SHAFTING

Boston (dealers)	$12.00 to 13.00
Chicago	19.50 to 20.50
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	12.00 to 13.00
Pittsburgh	13.00 to 14.00
St. Louis	12.50 to 13.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$12.50 to 13.00
Birmingham, tram car	12.00 to 12.50
Boston (consumers)	17.50 to 18.00
Buffalo, iron	13.00 to 14.00
Chicago, iron	13.00 to 13.50
Cincinnati	11.00 to 12.00
Cleveland, iron	35.00 to 36.50
Detroit	12.00 to 13.00
Eastern Pennsylvania, iron	17.00 to 18.00
New York, iron	13.00 to 13.50
Pittsburgh, iron	13.00 to 13.50
Pittsburgh, steel	13.00 to 13.50
St. Louis, iron	11.50 to 12.00

NO. 1 CAST SCRAP

Birmingham, cupola	$16.50 to 17.50
Boston (consumers)	17.00 to 17.50
Buffalo	15.00 to 16.00
Chicago, cupola	14.00 to 14.50
Cincinnati, No. 1, machinery, cupola (net)	12.00 to 13.00
Cleveland, cupola	17.50 to 18.00
Eastern Pennsylvania, cupola	17.50 to 18.50
New York cupola (dealers)	13.50 to 14.00
Pittsburgh, cupola	15.00 to 16.00
San Francisco	20.00 to 22.00
St. Louis, agricultural	13.00 to 13.50
St. Louis, railroad	13.50 to 14.00
Valleys	18.00 to 19.00

HEAVY CAST

Boston (consumers)	$12.00 to 13.00
Buffalo	16.00 to 16.50
Cleveland	12.00 to 12.50
New York (dealers)	13.00 to 13.50
Pittsburgh	13.50 to 14.00

MALLEABLE

Boston, railroad	$14.50 to 15.00
Buffalo	11.50 to 12.50
Chicago, railroad	13.00 to 13.50
Chicago, agricultural	13.00 to 13.50
Cincinnati, agricultural	8.50 to 9.00
Cincinnati, railroad	8.50 to 9.00
Cleveland, agricultural	11.00 to 11.50
Cleveland, railroad	14.00 to 14.50
Detroit	9.00 to 9.50
Eastern Pennsylvania, railroad	15.00 to 16.00
Pittsburgh, railroad	12.00 to 12.50
Pittsburgh, agricultural	9.00 to 10.00
St. Louis, agricultural	9.00 to 9.50
St. Louis, railroad	9.00 to 9.50

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Birmingham	$12.00 to 13.00
Boston (dealers)	8.00 to 9.00
Chicago	12.50 to 13.00
Cleveland	14.50 to 15.00
Detroit (dealers)	10.00
Eastern Pennsylvania	16.50 to 17.50
New York (dealers)	13.50 to 14.50
Pittsburgh district	13.00 to 14.00
St. Louis	10.50 to 11.00

LOCOMOTIVE TIRES

Chicago	$12.00 to 12.50
St. Louis	9.00 to 9.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$12.50 to 13.00
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	12.50 to 13.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

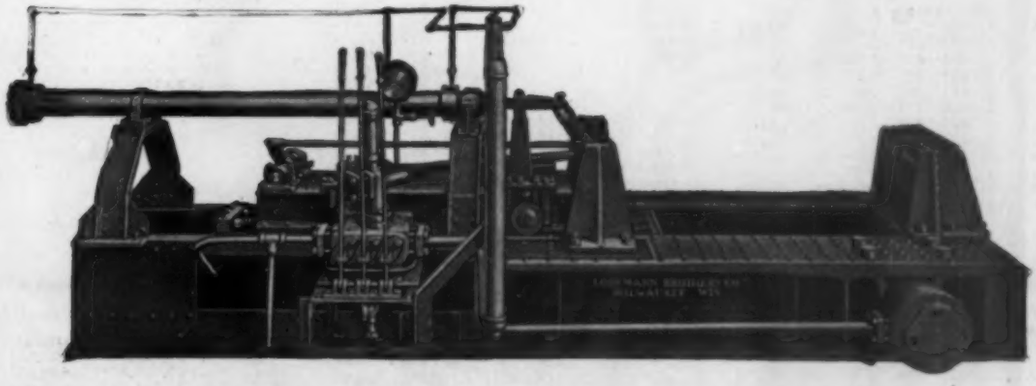
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

Iron and Steel Production

Compiled By THE IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	—Output— Total	Av. daily
1907				
January	376	311	2,174,801	69,509
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,299,732	
1908				
January	398	139	1,081,813	34,316
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,630,140	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,186
October	413	309	2,589,681	84,001
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,337,002	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,747
March	417	310	2,588,736	83,580
April	418	291	2,477,700	82,590
May	421	206	1,871,388	60,367
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,793	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,192
Total			26,840,314	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,867
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,287,800	89,929
February	423	306	2,778,670	92,095
March	423	278	2,562,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,716,825	90,865
June	422	283	2,816,883	87,229
July	422	264	2,658,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,594,098	83,137
October	425	244	2,439,924	81,933
November	424	225	2,529,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	355	3,238,970	104,483
September	431	344	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	436	319	2,318,242	82,794
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,602
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,270
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,168
September	434	317	3,124,308	104,173
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,927,088	68,906
March	436	103	1,593,542	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,065,965	35,532
Total			9,411,001	

Lake Ore Shipments

Gross Tons

1920	60,411,572
1919	48,546,651
1918	62,836,172
1917	64,437,003
1916	66,658,466
1915	47,272,751
1914	32,729,726
1913	49,947,116
1912	48,221,546
1911	32,793,130
1910	43,435,171
1909	42,586,869
1908	26,014,987
1907	42,266,668

By Months, 1921

April	176,211
May	2,594,027
June	3,600,989
Total	6,371,227

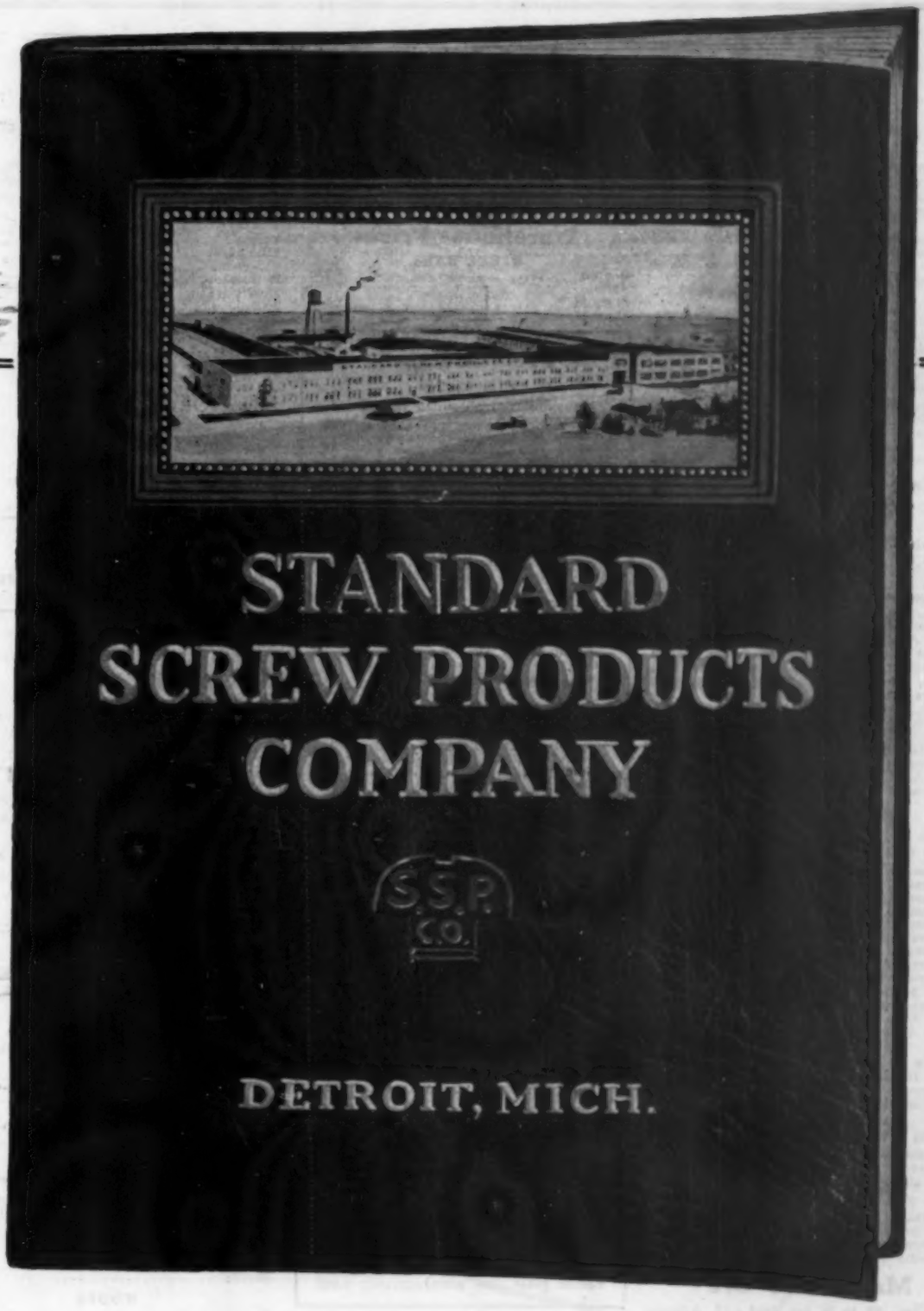
Ingots and Castings

By American Iron & Steel Institute

	Ingots	Castings	Total
1910	25,154,087	940,832	26,094,919
1911	23,029,479	646,627	23,676,106
1912	30,284,682	966,621	31,251,303
1913	30,280,130	1,020,744	31,300,874
1914	22,819,784	693,246	23,513,030
1915	31,284,212	866,824	32,151,036
1916	41,401,917	1,371,763	42,773,680
1917	43,619,200	1,441,407	45,060,607
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232

Monthly Ingot Output

	Gross Tons 84.21 per cent of capacity	Indicated total
January	2,203,186	2,620,000
February	1,749,477	2,080,000
March	1,570,978	1,860,000
April	1,213,958	1,440,000
May	1,265,850	1,500,000
June	1,003,406	1,190,000
Total	9,006,855	10,690,000



The Above Catalogue Is a Compilation of Valuable Information for the Buyer, Illustrating and Describing Special Screw Machine Products, also the Well Known Standards Manufactured by Us.

Iron and Steel Prices

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal.	$70.00 to 80.00
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	68.00 to 70.00
Spiegel, 18 to 22 per cent furnace, spot	27.00 to 30.00
Ferrosilicon, 50 per cent, contract delivered	65.00 to 80.00
Ferrotungsten, standard, per pound contained	45.00c to 50.00c
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, per pound contained, maker's plant	12.00c to 14.50c
Imported ferrochrome, 6 to 8 per cent carbon	14.00c to 15.00c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$5.00 to 6.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Cast Iron Water Pipe

Without War Freight Tax
Class B Pipe

Four-inch, Chicago	52.10 to 57.10
Six-inch and over, Chicago	49.10 to 54.10
Four-inch, New York	53.30 to 55.30
Six-inch and over, New York	48.30 to 50.30
Four-inch, Birmingham	45.00 to 50.00
Six-inch and over, Birmingham	40.00 to 45.00
Three-inch, Birmingham	55.00 to 60.00

Class A pipe is $3 higher than Class B.
Standard fittings, Birmingham, base..$100.00
6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Rivets

Structural rivets	2.80c to 2.90c
Boiler rivets, Pittsburgh	2.90c to 3.00c
Rivets ⅞ in. and smaller, Pittsburgh	65-10-10

Nuts and Bolts

NUTS

(Up to 1¼ and 1½ inches inclusive)

Hot pressed, square blank	$4.60 off
Hot pressed, square tapped	4.25 off
Hot pressed, hexagon blank	4.60 off
Hot pressed, hexagon tapped	4.25 off
Cold pressed, square tapped	4.25 off
Cold pressed, square blank	4.60 off
Cold pressed, hexagon tapped	4.25 off
Cold pressed, hexagon blank	4.60 off
Cold pressed semifinished hexagon nuts ⅜ in. and larger	70-10-10-10 off
Cold pressed semifinished hexagon nuts 9/16 in. and smaller	80-10-10 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	65-10 off
Cut thread	60-10 off
Larger and longer	60-10 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	70-7½ off
Cut thread 6	65-10 off
Larger and longer	65-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	60-5 off
Larger and longer	60 off
Lag screws	70 off
Plow bolts Nos. 1, 2 and 3 heads	60-10 off

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, nominal.

Indian 48 to 50 per cent c.i.f. Atlantic ports, 22½ to 24 cents per unit, nominal.

Fluor Spar

Washed gravel Kentucky and Illinois mines, per ton..... nom. $20.00

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$4.85
Old bed concentrates, 63 per cent	5.75
Harmony, cobbed, 63 per cent	5.75
New bed, low phos., 65 per cent	8.50
Lump ore for fix	6.00

Warehouse Prices

STEEL BARS

Boston	3.53c
Buffalo	2.95c
Chicago	3.13c

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:

Cleveland	$1.96
Newark, N. J.	6.72
Boston	7.28
Philadelphia	6.32
Pittsburgh	1.96
Chicago	5.32
St. Louis	6.44
Minneapolis, St. Paul	7.60

Buffalo to:

Albany, N. Y.	$2.52
New England (rail)	5.46
New York and Brooklyn (rail)	5.46

Virginia furnaces to:

Philadelphia	$5.74
New England	6.58
Brooklyn, Jersey City, Newark	6.16

Birmingham, Ala., to:

Boston	$10.665
Boston (rail and water)	7.65
Cincinnati	4.50
Chicago	6.66
Cleveland	6.66
Louisville, Ky.	4.12
Minneapolis, St. Paul	9.73
New York	10.265
Philadelphia	8.665
Pittsburgh	7.60
Savannah, Ga.	4.25
St. Louis	5.725

Chicago to:

Des Moines	$4.725
Minneapolis, St. Paul	3.375
Milwaukee	0.89
Moline, Ill.	1.89
Omaha	6.07
St. Louis	2.725

Ironton and Jackson, O., to:

Chicago	$5.32
Cincinnati	2.52
Cleveland	3.36
Detroit	3.64
Indianapolis	3.22
Minneapolis, St. Paul	8.40

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	$0.38
Philadelphia	0.35
Boston	0.415
Buffalo	0.295
Baltimore	0.335
Cleveland	0.24
Cincinnati	0.32
Chicago	0.38
Detroit	0.32
Minneapolis and St. Paul	0.66
Denver	1.32
St. Louis	0.475
New Orleans	0.515
Birmingham	0.765
Pacific coast (all rail)	1.665
Pacific coast (tin plate)	1.665

Cincinnati	3.58c
Cleveland	2.79c
Detroit	2.98c
New York	2.93c
Philadelphia	2.90c
San Francisco	4.35c
Seattle	4.15c
St. Louis	3.025c
St. Paul	3.41c

IRON BARS

Boston	3.53c
Buffalo	2.95c
Chicago	3.13c
Cincinnati	3.58c
Detroit	2.98c
New York	3.13c
Philadelphia	2.90c
St. Louis	3.025c

SHAPES

Boston	3.63c
Buffalo	3.05c
Chicago	3.23c
Cincinnati	3.68c
Cleveland	2.89c
Detroit	3.08c
New York	3.03c
Philadelphia	3.00c
San Francisco	4.45c
Seattle	4.15c
St. Louis	3.125c
St. Paul	3.51c

PLATES

Boston	3.83c
Buffalo	3.05c
Chicago	3.23c
Cincinnati	3.60c
Cleveland	3.09c
Detroit	3.08c
New York	3.03c
Philadelphia	3.00c
San Francisco	4.50c
Seattle	4.25c
St. Louis	3.125c
St. Paul	3.51c

NO. 10 BLUE ANNEALED SHEETS

Boston	4.83c
Buffalo	3.70c
Chicago	3.68c
Cincinnati	4.78c
Cleveland	3.40c to 3.50c
Detroit	3.73c
New York	3.68c
Philadelphia	3.65c
San Francisco	6.00c
Seattle	5.60c
St. Louis	3.775c
St. Paul	3.96c

NO. 28 BLACK SHEETS

Boston	5.50c
Buffalo	4.80c
Chicago	4.90c
Cincinnati	5.68c
Cleveland	4.24c to 4.50c
Detroit	4.83c
New York	4.50c
Philadelphia	4.50c
San Francisco	7.00c
Seattle	6.45c
St. Louis	4.995c
St. Paul	5.18c

NO. 28 GALVANIZED SHEETS

Boston	6.50c
Buffalo	5.80c
Chicago	5.90c
Cincinnati	6.78c
Cleveland	5.25c to 5.50c
Detroit	5.83c
New York	5.50c
Philadelphia	5.50c
San Francisco	8.00c
Seattle	7.45c
St. Louis	5.995c

BANDS

Boston	4.23c
Buffalo	3.65c
Chicago	3.78c
Detroit	3.68c
New York	3.58c
Philadelphia	3.60c
San Francisco	5.00c
Seattle	4.85c

HOOPS

Boston	4.90c
Buffalo	3.65c
Detroit	3.68c
New York	4.13c to 4.18c
Philadelphia	3.85c

COLD ROLLED SHAFTING

Boston	4.65c
Buffalo	4.35c
Chicago	4.63c to 5.13c
Detroit	4.30c
New York	4.43c
New York (flats, squares and hexagons)	4.93c
Philadelphia	4.50c
San Francisco	6.25c
Seattle	5.75c

H. W. Caldwell & Son Company enters the LINK-BELT FAMILY

The Link-Belt Company has acquired all of the capital stock of the H. W. Caldwell & Son Company, and Mr. Frank C. Caldwell has been elected a director of the Link-Belt Company.

Two experienced and successful companies in the conveyor world have thus joined forces, with the result that the Link-Belt Company has added two new lines, Helicoid Conveyors and power transmission machinery, to its line of manufactures.

While the H. W. Caldwell & Son Company's plant will continue to operate under separate corporate existence and under its present name, the joint facilities of the two companies, and the broader avenues of distribution of the Link-Belt Company, ought to prove of distinct advantage to the customers of both.

There will be no modifications of the policies of the Caldwell plant, no impairment of its service to its customers, no change in the diversity and character of its product.

The plant management will remain substantially the same, and the new owners like the old will proceed on the theory that the good will of its customers is the company's best asset.

LINK-BELT COMPANY

Charles Piez

President.

LINK BELT COMPANY PHILADELPHIA CHICAGO INDIANAPOLIS

700

New Trade Publications

SAFETY TILE—The Norton Co., Worcester, Mass., has published a six page folder which explains the qualities of a composition tile for use on floors and stairways. A separate page enumerates the sizes, thicknesses and shapes in which the commodity can be supplied.

TRAVELING CRANES—Illustrations of installations feature a booklet issued by the Northern Engineering Works, Detroit, Mich. Uses of grab buckets are especially explained. Types of trolleys to be used in connection with the buckets are discussed.

FORGING MACHINERY—Talks on the application of heavy pattern forging machines have been prepared by the National Machinery Co., Tiffin, O., and are distributed to the trade in the form of a folder. A description of an actual operation is given.

BAR MARKINGS—Numerals for marking iron and steel reinforcing bars are advocated by Duncan & Rogow, 44 Cedar street, New York in a pamphlet issued recently. Numerical equivalents for the fractional systems are set forth on the folder.

BOILERS AND TANKS—Sizes, workmanship, types, materials and construction of tanks and boilers produced by the Youngstown Boiler & Tank Co., Youngstown, O., are discussed in an illustrated pamphlet. It also contains a list of the companies who have installed this manufacturer's product.

PUNCHES AND SHEARS—A summary of the equipment manufactured by the Cleveland Punch & Shear Works Co., Cleveland, is contained in a folder now available. These products include punches, shears bending rolls, straightening rolls, wall radial drills, plate planers, rotary planers, dies, markers, rivet sets, barrel pins, drift pins, chisel blanks.

PORTABLE CONVEYORS—Statements are presented by the Freeman-Riff Co., Terre Haute, Ind., in a pamphlet published recently that handling charges determine profits and that reduced handling charges mean lower net cost. Portable conveyors are set forth as a means to this end. Illustrations which are provided show this equipment in operation and diagrams assist the manufacturers in pointing out arrangements under operation conditions.

ENGINEERS AND BUILDERS—An attractive booklet has been issued recently by the H. K. Ferguson Co., 6523 Euclid avenue, Cleveland which has for its title, "The Relation Between Advertising and Construction." The author draws a comparison between the advanced construction activities of those companies which are national advertisers and those which do not attempt far-reaching publicity campaigns. Statistics are used to point out that the extensive advertisers expand more rapidly and require more buildings.

MILL-TYPE MOTOR—Steel mills, in connection with the driving of mill tables, screwdowns, and tilting tables, require motors of special capacities. Realizing this the General Electric Co., Schenectady, N. Y., has developed a special direct current mill-type motor which is explained and illustrated in a bulletin recently published. Applications, ratings, nomenclature, bearings, gears and gear cases, armatures, commutators, brushes, poles, field coils, connections, terminals, and controls are illustrated. The booklet contains 22 figures and three pages of dimensions.

PNEUMATIC TOOL ACCESSORIES—Eleven principal attachments for pneumatic tools are described in a booklet now being distributed by the Ingersoll-Rand Co., 11 Broadway, New York. These include: air hose, hose couplings, drill chucks, chisels and blanks, rivet sets and blanks, wire brushes, oils and greases, rail bonding drills, rail drills, railroad kit boxes. Each accessory and the types are illustrated and explained. Line drawings with the principal dimensions are included in the contents. A data sheet contains the dimensions for all sizes of rivets.

Industrial Business Changes Recently Announced

THE Atlantic Stamping Co., Rochester, N. Y., has opened sales and display offices in the Bush Terminal Sales building, 130 West Forty-second street, New York, according to W. B. Mitchell, manager of the house furnishing division of the building, whose department covers the line of products manufactured by the Atlantic Stamping Co.

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The Garage Appliance Mfg. Co., Chicago, has been dissolved.

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The Woodlawn Machine Works, Inc., Chicago, has changed its name to the W. A. Baker Co.

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Sunderland & Co., Chicago, machine tools, has announced the removal of its plant to Warsaw, Ind.

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The real estate, buildings, machinery, tools and other equipment of the defunct Helbing-Knaup Mfg. Co., Beaver Dam, Wis., was bid in at receiver's sale by the Bell Mfg. Co., Beaver Dam, which will add the shop to its plant for the manufacture of steel barn equipment and other metal farm appliances and accessories.

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Property of the Richard French Iron Works, Worcester, Mass., has been sold to the Arcade Malleable Iron Co., Millbury, Mass.

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Changing its name from the Rostand Mfg. Corp., the company, with headquarters in Milford, Conn., now is known as the Rostand Mfg. Co.

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The Jackson Light Mfg. Co., Jackson, Wis., is the new name and location of the Meehan Mfg. Co., Milwaukee, manufacturer of farm lighting systems.

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Purchase of the foundry of the M. P. Brundige Co., Inc., Dorchester, Mass., has been made by the George F. Croak Foundry Co., Boston, which recently was organized.

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The Morse-Roger Steel Co., Guardian building, Cleveland, which recently leased a warehouse from the J. T. Tractor Co. on Fairfield avenue, Cleveland, has moved its offices to the new building.

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Purchase of the former plant of the Brien Heater Co. in Westfield, Mass., by the Raderoid Mfg. Co., Boston, has been announced. The company will manufacture automobile accessories and imitation leather goods.

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General offices of the Walworth Mfg. Co. have been moved from First and O streets, Boston, to Pearl and High streets, that city. The eastern division sales offices of the company will remain at First and O streets and the Boston branch at 142 High street.

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The New York Central Iron Works Company, Inc., Hagerstown, Md., has discontinued its Baltimore representation which was located in the Builder's Exchange. All inquiries from the Baltimore district are now being handled by the company's home office at Hagerstown.